EXHIBIT J

Leg-Powered Treadmill

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Case Name:	Speedfit LLC and Aurel Astilean, v. Woodway USA
Beacon Project No.:	10034
Report Date:	July 27, 2015
Prepared by:	James D. Whelan, P.E.

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ASSIGNMENT

On July 21, 2015, Mr. John Vodopia contacted Beacon Forensic, P.C. (BFPC) to review file material concerning a leg-powered treadmill. The plaintiff, Mr. Aurel Astilean, invented a leg-powered treadmill and filed a provisional patent application and subsequently secured two issued patents. It was reported that the defendant, Woodway USA and Mr. Douglas Bayerlein its President and CEO, stated that the leg-powered treadmill as disclosed in the provisional patent application does not enable one to make the invention as claimed in the issued patents.

The scope of the assignment was to determine if the invention as described in the provisional patent application was sufficient to allow one to make the invention as claimed in two issued patents: United States Patent 8,308,619 B1 (Patent 619) and United States Patent 8,343,016 B1 (Patent 016).

In response to this request, BFPC completed the following:

- Reviewed file material:
  - Provisional Patent Application No. 61/280,265
  - United States Patent 8,308,619 B1
  - United States Patent 8,343,016 B1
  - Letter from Mr. Richard McKenna dated January 21, 2011
  - Strategic Evaluation Agreement not completed
  - Document titled “Woodway Debuts SpeedBoard at IHRSA Show”
  - 275 digital colored photographs of the leg-powered treadmill
  - 7 colored drawings of the leg-powered treadmill
  - 49 colored photocopied drawings and photographs of the leg-powered treadmill and additional images
  - Second Amended Complaint dated February 17, 2015
- BFPC constructed test fixtures and completed testing as to the inventions disclosed in the provisional patent application and claimed in the issued patents
- BFPC completed an analysis as to the similarity of designs in the provisional patent application and Patents 619 and 016

ENCLOSURE LIST

- Appendix A: Provisional Patent Application No. 61/280,265
- Appendix B: United States Patent 8,308,619 B1
- Appendix C: United States Patent 8,343,016 B1

PROVISIONAL PATENT APPLICATION

The following was noted from the Provisional Patent Application (Appendix A):

Application Number:	61/280,265
Filing Date:	11/02/2009
Applicant:	Mr. Astilean, East Hampton, New York

The written description contained the following:

> The description of the invention which follows, together with the accompanying drawing should not be construed as limiting the invention to the example shown and described, because those skilled in the art to which this invention appertains will be able to devise other forms thereof.
>
> Fig. 1 (**Figure 1**) is a perspective view of a leg-powered treadmill constructed and having an operating mode according to the present invention.
>
> Illustrated are two leg supports 10 and 12 which lift the treadmill 14 in a clearance position above a support surface 16, said treadmill 10 having space apart sides 18 and 20 which have journalled for rotation end rollers 22 and 24 which support a closed loop treadmill belt 26. Springs (not shown) exert spring urgency in opposite directions holding taut the length of the lower belt portion 26A in a dimension of approximately twenty-three inches denoted by arrow 30 and in the upper belt portion 26B weighing approximately forty pounds, denoted by the arrow 30.
>
> It is to be noted that an essential feature of treadmill 10 is a concave shape subtending an acute angle 34 in the treadmill 10 front end 14A which in practice results in the exerciser 36 running uphill and concomitantly exerting body weight 38 that contributes to driving lengthwise 40 in the direction 42 in which the exerciser runs and achieves the benefits of the exercise.
>
> It is known from common experience that in prior art treadmills, the upper length portion of their closed loops are flat due, it is believed, because of the inability to maintain the concave shape 34 in the length portion 26B. This shortcoming is overcome by the weight 30 which in practice has been found to hold the concave shape 34 during the uphill running of the exerciser 36.

The provisional patent application referenced a drawing seen in **Figure 1**.

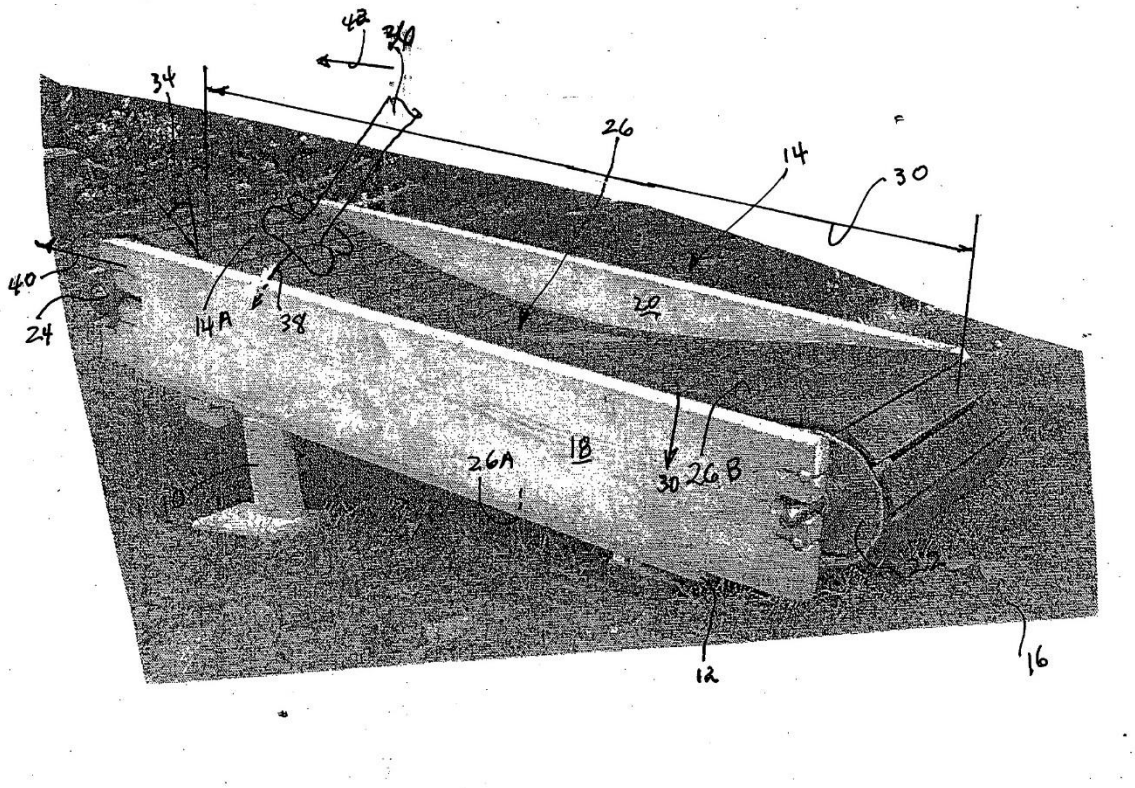


Figure 1: Provisional Patent Application Figure 1.

PATENT US 8,308,619 B1

The following was noted from the Patent 619 (Appendix B):

Patent No.:	US 8,308,619 B1
Application No.:	12/925,770
Filing Date:	10/29/2010
Patent Date:	11/13/2012
Inventor:	Mr. Astilean, East Hampton, New York
Related US Application Data:	Provisional application No. 61/280,265, filed on Nov 2, 2009

The patent contained a single claim which stated the following:

> 1. A motor-less, leg-powered treadmill comprising:
>
> a treadmill frame;
>
> a set of respective front and rear pulley end rollers for rotation, said front and rear pulleys supporting a closed loop treadmill belt;
>
> said closed loop treadmill belt comprising a plurality of parallel slats oriented perpendicular to an axis of rotation of said belt, said parallel slats attached to each other in a resilient fashion;
>
> said closed loop treadmill belt being of such a length as compared to the distance between the end rollers to permit it to assume a required concave upper contour;
>
> a means
>
> > for slackening an upper concave portion of said closed loop treadmill belt while simultaneously keeping a lower portion of said closed loop treadmill belt taut, preventing said lower portion from drooping down during rotation and exertion of walking or miming force upon said upper concave portion of said closed loop treadmill belt,
> >
> > said means for slackening the upper portion while simultaneously keeping the lower portion taut, preventing said lower portion from drooping down during rotation and exertion of walking or running force upon said upper concave portion of said closed loop treadmill belt
> >
> > comprises a timing belt having respective timing belt pulleys attached to said front and rear pulley rollers for said closed loop treadmill belt,
> >
> > wherein timing belt idlers are used to configure said timing belt geometrically to fit within constraints of side contours of said treadmill,
> >
> > wherein if said closed loop treadmill belt is prevented from slipping relative to said end rollers by a high friction coefficient, once configured, said timing belt will not permit drooping down of said lower taut portion of said closed loop treadmill belt because all respective motion is synchronous.

The description of patent 619 provided additional detail concerning the means for slackening the upper portion of the belt while simultaneously keeping the lower portion of the belt taut. Specifically:

> A closed loop treadmill belt 26 is formed with a running surface of transverse wooden, plastic or rubber slats 49 (see FIG. 1 (**Figure 2**)) attached to each other in a resilient fashion. Since an essential feature of treadmill 10 is the concave shape of the low friction running surface of belt 26 in upper portion 26B, methods are used to insure that this shape is maintained during actual use. These methods must prevent the lower portion 26A of treadmill belt 26 from drooping down (i.e. must be held taut), otherwise top portion 26B would be pulled taut into a flat shape between rollers 22 and 24. Three methods are illustrated by the side view schematic drawings of FIGS. 2-4.
>
> The method of FIG. 2 (**Figure 3**) shows a flat support belt loop 50 engaged with two side pulleys 54 and a third pulley 56 which is attached to treadmill 10 frame. Two springs 52 pulling in opposite directions hold belt 50 taut with a flat top configuration in contact with bottom treadmill belt portion 26A. Since pulleys 54 and 52 are low friction, and there is no relative movement between belt 50 and belt 26, belt 50 imposes very little drag on belt 26 while supporting lower belt portion 26A vertically preventing it from drooping down.
>
> The method shown in FIG. 3 (**Figure 3**) shows the use of a timing belt 67 in achieving a similar result. Here end rollers 60 and 64 are attached to timing belt pulleys 62 and 66 respectively. Timing belt idlers 68 are simply used to configure timing belt geometrically to fit within the constraints of the side contours of treadmill 10. If belt 26 is prevented from slipping relative to end rollers 60 and 64 by high friction coefficient (or by the use an integral timing belt on the inside of belt 26 and rollers with timing belt engagement grooves), once configured as shown, timing belt 67 will not permit drooping down of section 26A since all motion is now synchronous.
>
> In another method shown in FIG. 4, (**Figure 3**) one or more linear arrays of bearings 70 extending along opposite peripheral edges of said treadmill frame physically support lower section 26A of treadmill belt 26 thereby preventing drooping. Bearings 70 may be ball bearings or straight ball bearing casters attached and located at respective side peripheral edges to the bottom surface of the frame of treadmill 10.

Patent 619 referenced one drawing seen in **Figure 2** and three drawings seen in **Figure 3**.

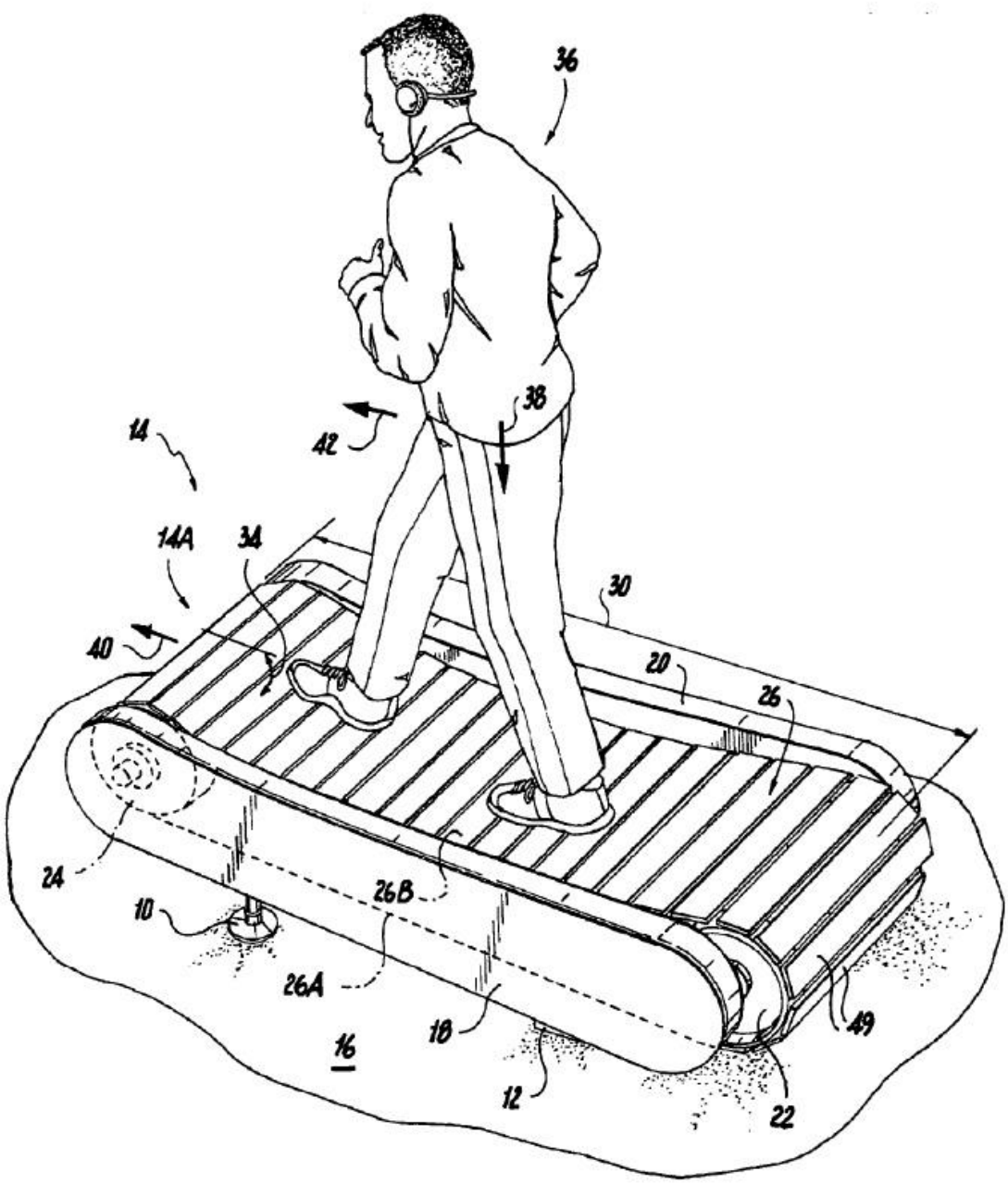


Fig. 1

Figure 2: Drawing 1 from Patent 619.

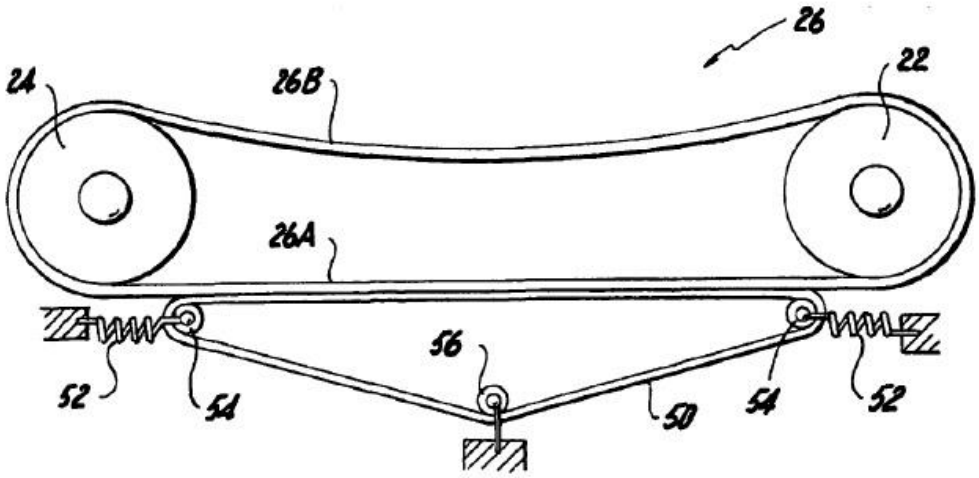


Fig. 2

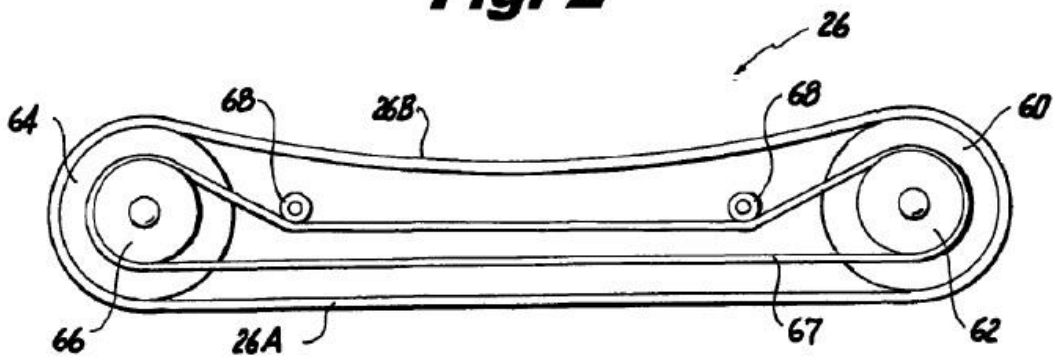


Fig. 3

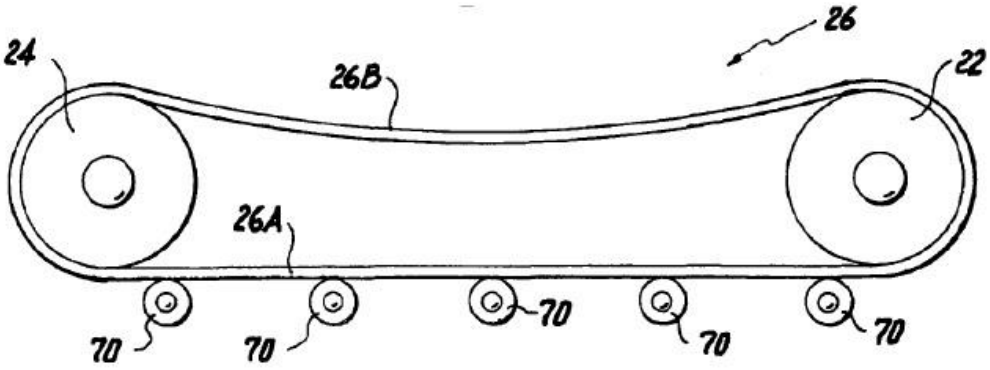


Fig. 4

Figure 3: Drawings 2 through 4 from Patent 619.

PATENT US 8,343,016 B1

The following was noted from the Patent 016 (Appendix C):

Patent No.:	US 8,343,016 B1
Application No.:	12/925,892
Filing Date:	11/1/2010
Patent Date:	1/1/2013
Inventor:	Mr. Astilean, East Hampton, New York
Related US Application Data:	Continuation-in-part of application No. 12/925,770 Provisional application No. 61/280,265, filed on Nov 2, 2009

The patent contained 17 claims. Claim 1 stated the following:

> 1. A motor-less, leg-powered curved treadmill comprising:
>
> a treadmill frame;
>
> a set of respective front and rear pulley end rollers for rotation, said front and rear pulleys supporting a closed loop treadmill belt;
>
> said closed loop treadmill belt comprising a plurality of parallel slats oriented perpendicular to an axis of rotation of said belt, said parallel slats attached to each other in a resilient fashion;
>
> said closed loop treadmill belt being of such a length as compared to the distance between the end rollers to permit it to assume a required concave upper contour;
>
> a means for slackening an upper concave portion while simultaneously keeping a lower portion of the belt taut, preventing said lower portion from drooping down during rotation and exertion of walking or running force upon said upper concave portion of said closed loop treadmill belt;
>
> wherein each said slat is made of a material with sufficient resiliency and strength and weight to lie on and conform to a concave row of upper support peripheral ball bearings located at each peripheral side of said upper portion of said motor-less, leg-powered curved treadmill.

The description of Patent 016 provided additional detail concerning the means for slackening the upper portion of the belt while simultaneously keeping the lower portion of the belt taut. It also contained drawings to assist in understanding the subject matter. The said description and drawings in the Patent 016 were generally repeated from the Patent 619. They were not repeated in this section of the report.

TESTING

Demonstrative testing of the inventions as described in the provisional patent application and the patents was completed. A control model contained the elements of the invention except a method of keeping the lower belt portion taut. The test setup consisted of six variations.

The first two models were constructed to be consistent with the description of the provisional patent application. The first model (**Figure 4**) comprised of a frame that represented the treadmill frame, which had two sides. The sides were spaced apart and had journalled ends to accept bearings which coupled to

end rollers. The end rollers supported a closed loop belt. The closed loop belt comprised of an upper portion and lower portion. The belt portions had weight. A spring loaded in tension, such that the resultant load was in opposite directions at the spring's end and held taut the lower belt portion. The following was observed during testing: as the weight and belt traveled, the top portion of the belt retained the concave shape and the bottom portion of the belt was taut, not slacked (**Figure 5**). When the weight was removed from the belt, the top belt portion retained its concave shape and the bottom portion remained taut, not slacked (**Figure 6**).

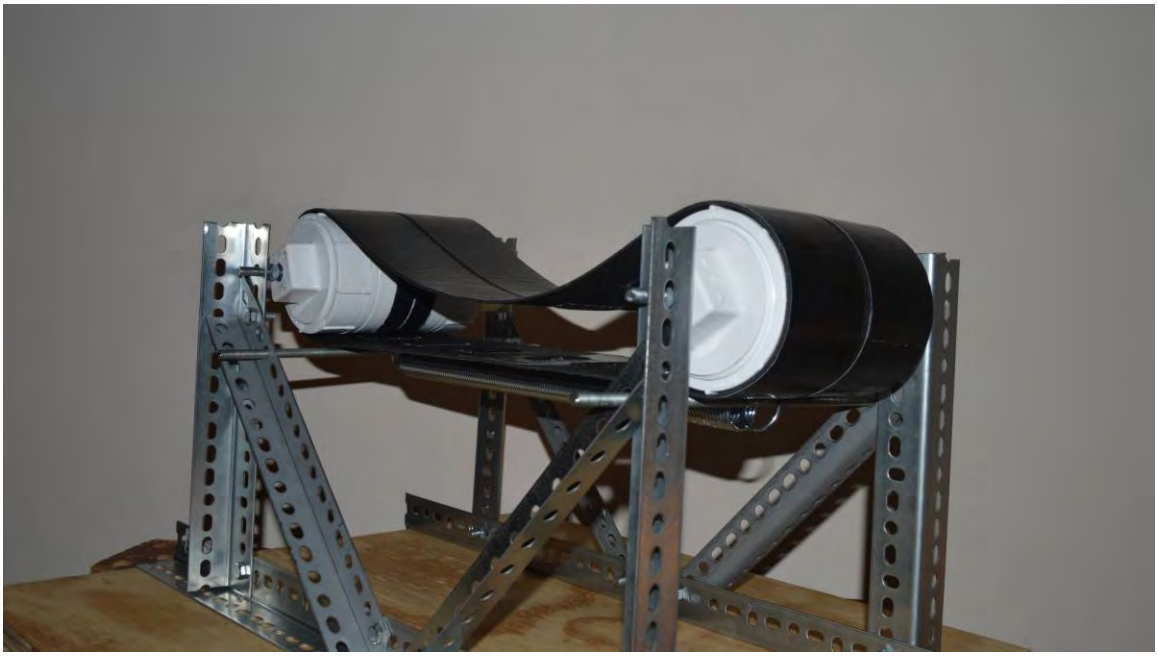


Figure 4: Model consistent with the provisional patent application description.

Figure 5: Model consistent with the provisional patent application description, loaded.

Figure 6: Model consistent with the provisional patent application description, unloaded. Note the treadmill belt top portion retained the concave shape and the bottom portion was taut.

The second model (**Figure 7**) comprised of a frame that represented the treadmill frame, which had two sides. The sides were spaced apart and had journalled ends to accept bearings which coupled to end rollers. The end rollers supported a closed loop belt. The closed loop belt comprised of an upper portion and lower portion. The belt portions had weight. A leaf spring loaded in bending, such that the resultant load was in opposite directions at the spring's end and midpoint, held taut the lower belt portion. The following was observed during testing: as the weight and belt traveled, the top portion of the belt retained the concave shape and the bottom portion of the belt was taut, not slacked (**Figure 8**). When the weight was removed from the belt, the top belt portion retained its concave shape and the bottom portion remained taut, not slacked (**Figure 9**).

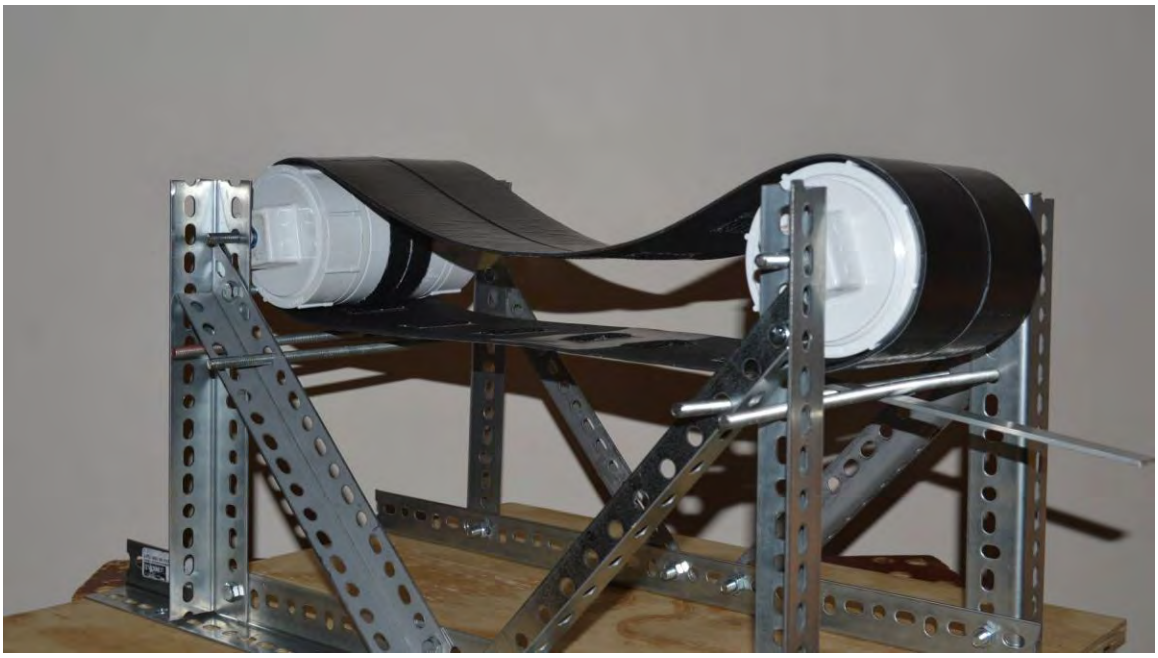


Figure 7: Model consistent with the provisional patent application description.

Figure 8: Model consistent with the provisional patent application description, loaded.

Figure 9: Model consistent with the provisional patent application description, unloaded. Note the treadmill belt top portion retained the concave shape and the bottom portion was taut.

The third model (**Figure 10**) was constructed to be consistent with what was claimed and contained in the description of Patents 619 and 016. It comprised of a frame that represented the treadmill frame; front and rear pulley end rollers for rotation; a closed loop belt supported by the pulley end rollers; the test belt did not contain slats which could have been added and would not change the test results; the said closed loop belt having a concave upper contour; a means for slackening the upper belt portion and simultaneous keeping the lower belt portion taut during rotation and exertion to include cyclical forces on the upper belt portion. The said means for slackening included: a timing belt; timing belt pulleys are attached to said front and rear pulley rollers; timing belt idlers are used to configure the said timing belt geometrically; high friction coefficient to prevent the said closed loop treadmill belt from slipping relative to the end rollers; and the said timing belt prevents drooping of the said lower taut portion of said closed loop treadmill belt because all respective motion is synchronous. The following was observed during testing: as the weight and belt traveled, the top portion of the belt retained the concave shape and the bottom portion of the belt was taut, not slacked (**Figure 11**). When the weight was removed from the belt, the top belt portion retained its concave shape and the bottom portion remained taut, not slacked (**Figure 12**).

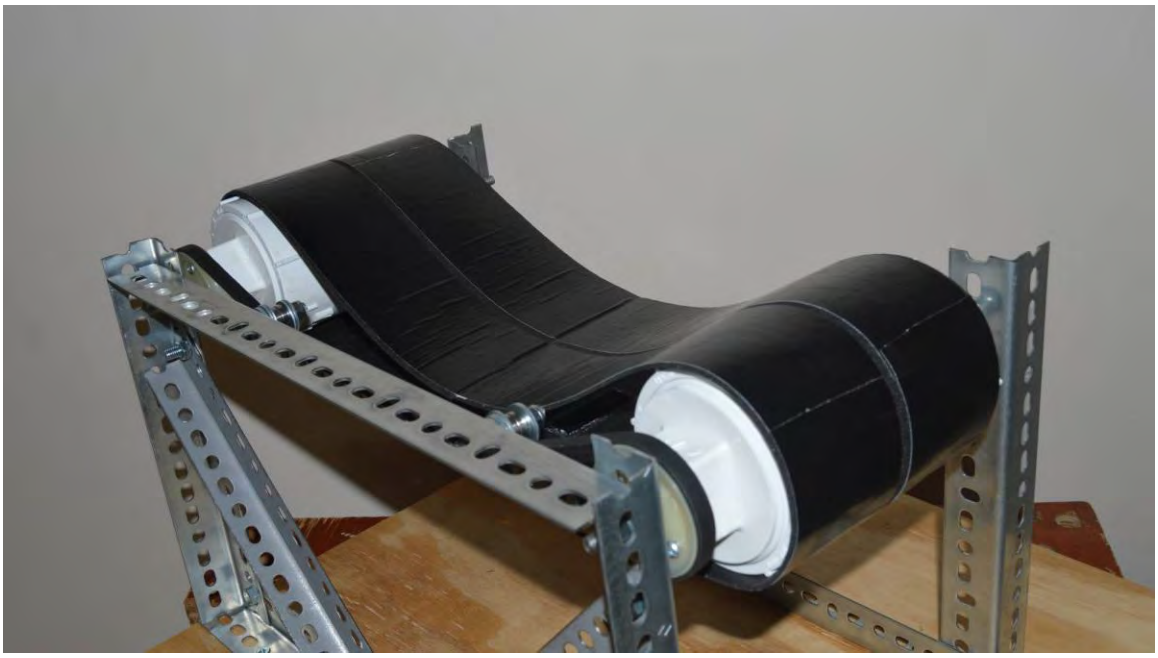


Figure 10: Model consistent with Patents 619 and 016.

Figure 11: Model consistent with Patents 619 and 016, loaded.

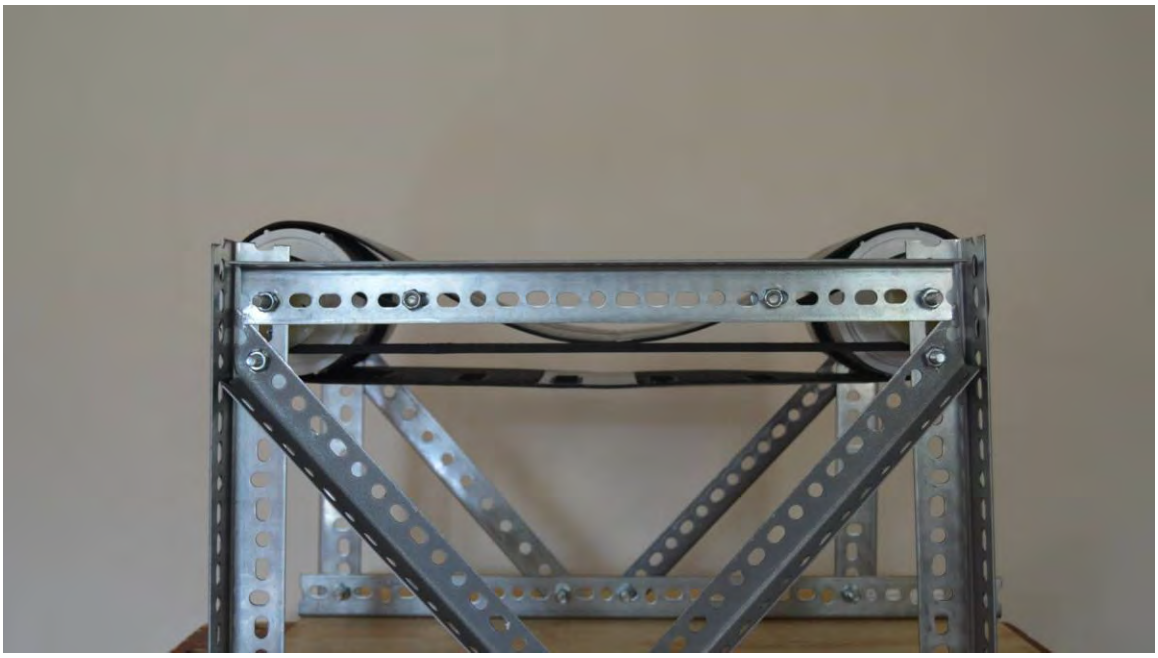


Figure 12: Model consistent with Patents 619 and 016, unloaded. Note the treadmill belt top portion retained the concave shape and the bottom portion was taut.

The fourth model (**Figure 13**) was constructed to be consistent with what was claimed and described in Patent 016 and described in Patent 619. It comprised of a frame that represented the treadmill frame; front and rear pulley end rollers for rotation; a closed loop belt supported by the pulley end rollers; the test belt did not contain slats which could have been added and would not change the test results; the said closed loop belt having a concave upper contour; a means for slackening the upper belt portion and simultaneous keeping the lower belt portion taut during rotation and exertion to include cyclical forces on the upper belt portion. The said means for slackening comprised: a flat support belt loop; two side pulleys engaged with the said flat support belt loop; a third pulley engaged with the said flat support belt loop and attached to treadmill frame; two springs pulling in opposite directions hold the flat support belt loop taut in contact with closed loop belt bottom portion; and the treadmill closed loop belt bottom portion is supported, preventing it from drooping down. The following was observed during testing: as the weight and belt traveled, the top portion of the belt retained the concave shape and the bottom portion of the belt was taut, not slacked (**Figure 14**). When the weight was removed from the belt, the top belt portion retained its concave shape and the bottom portion remained taut, not slacked (**Figure 15**). Also, slippage was observed between the two belts, but the treadmill closed loop belt remained taut.

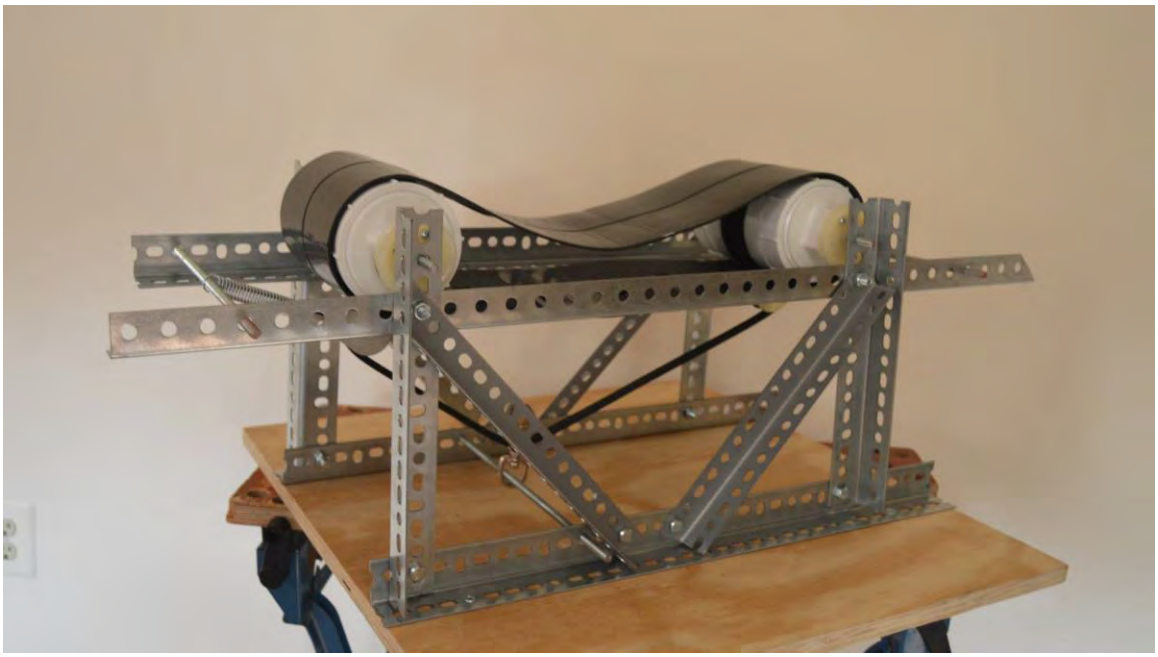


Figure 13: Model consistent with Patents 619 and 016.

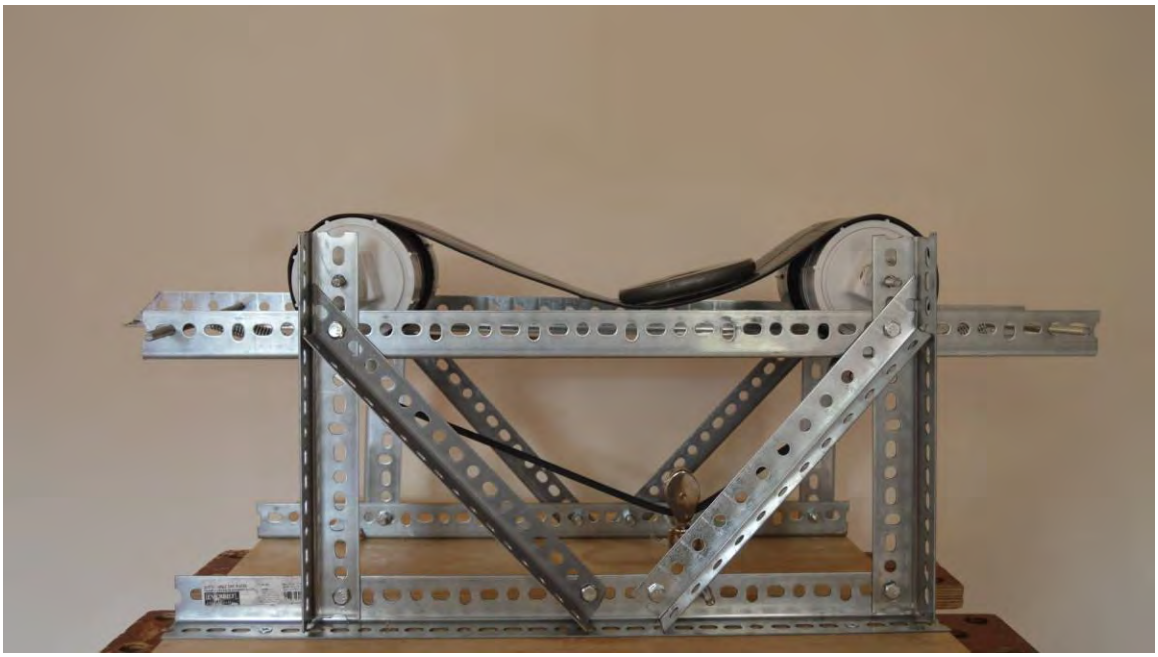


Figure 14: Model consistent with Patents 619 and 016, loaded.

Figure 15: Model consistent with Patents 619 and 016, unloaded. Note the treadmill belt top portion retained the concave shape and the bottom portion was taut.

The fifth model (**Figure 16**) was constructed to be consistent with what was claimed and described in Patent 016 and described in Patent 619. It comprised of a frame that represented the treadmill frame; front and rear pulley end rollers for rotation; a closed loop belt supported by the pulley end rollers; the test belt did not contain slats which could have been added and would not change the test results; the said closed loop belt having a concave upper contour; a means for slackening the upper belt portion and simultaneous keeping the lower belt portion taut during rotation and exertion to include cyclical forces on the upper belt portion. The said means for slackening comprised: two linear arrays of bearings extending along opposite peripheral edges of said treadmill frame; the said bearings physically support the closed loop treadmill belt lower portion preventing drooping; and the said bearings were attached and located at respective side peripheral edges to the bottom surface of the frame of treadmill. The following was observed during testing: as the weight and belt traveled, the top portion of the belt retained the concave shape and the bottom portion of the belt was taut, not slacked (**Figure 17**). When the weight was removed from the belt, the top belt portion retained its concave shape and the bottom portion remained taut, not slacked (**Figure 18**).

Figure 16: Model consistent with Patents 619 and 016.

Figure 17: Model consistent with Patents 619 and 016, loaded.

Figure 18: Model consistent with Patents 619 and 016, unloaded. Note the treadmill belt top portion retained the concave shape and the bottom portion was taut.

The sixth model was a control model that contained the elements of a treadmill without a means for keeping the belt taut when the top belt portion was unloaded. The following was observed during testing: as the weight and belt traveled, the top portion of the belt retained the concave shape and the bottom portion of the belt was taut, not slacked (**Figure 19**). When the weight was removed from the belt, the top belt portion lost its concave shape and the bottom portion became slacked (**Figure 20**).

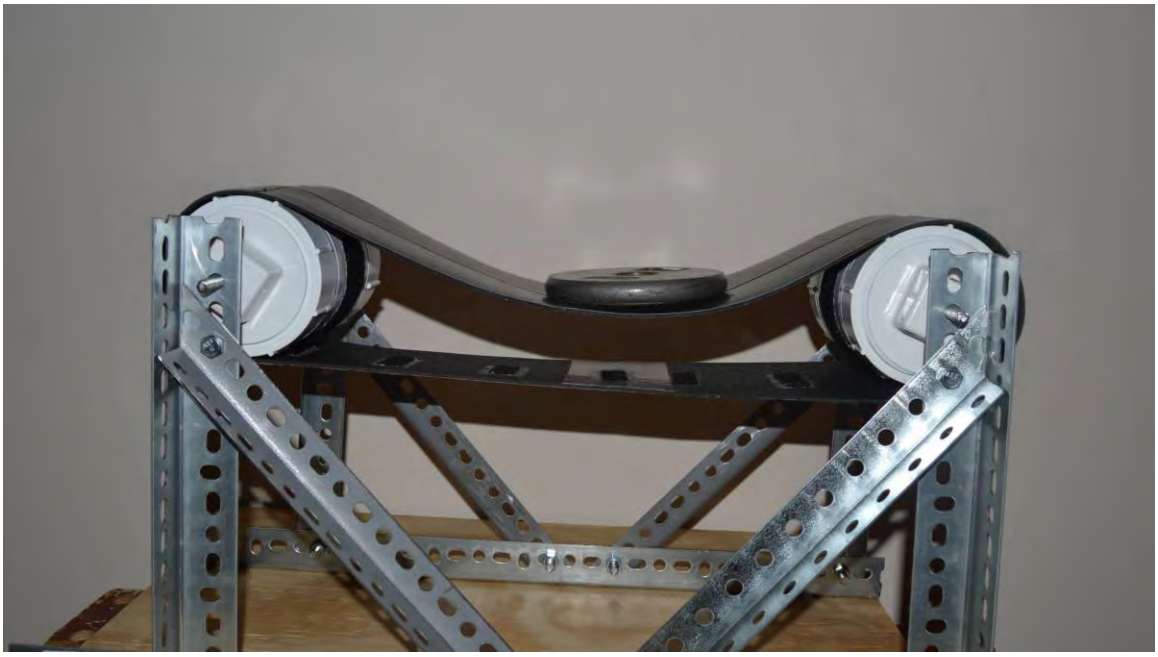


Figure 19: The control model, loaded.

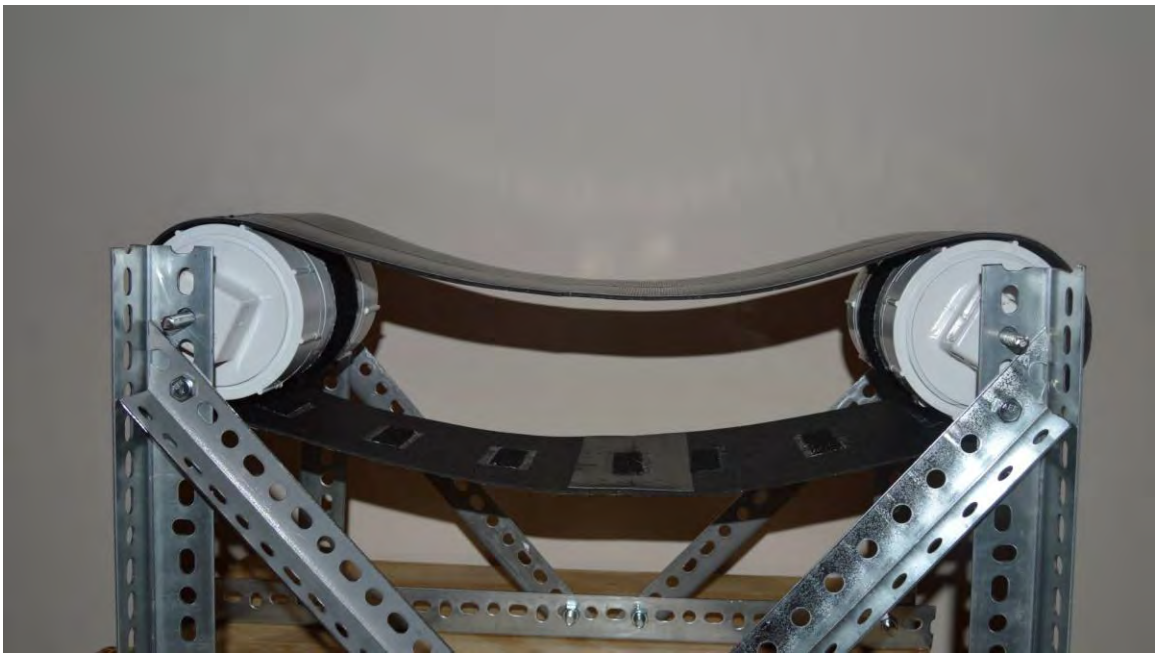


Figure 20: The control model, unloaded. Note the treadmill belt top portion lost the concave shape and the bottom portion was no longer taut.

DISCUSSION

The provisional patent application described a leg-powered treadmill which included the following elements:

a) two leg supports which lift a treadmill above a support surface;
b) the said treadmill;
c) with space-apart-sides;
d) the said space-apart sides are journalled;
e) rotation end rollers at the said journalled;
f) a closed loop treadmill belt on the said rotation end rollers;
g) the lower belt portion is taut approximately 23 inches by springs exerting spring urgency;
h) the said spring urgency acts in opposite directions;
i) the upper belt portion weighs approximate 40 pounds.

The provisional patent application further described the upper belt portion. It stated that an essential feature is a concave shape subtending an acute angle in the treadmill front end. The 40 pound weight was found to hold the concave shape during the uphill running. A drawing, **Figure 1**, was provided to assist in understanding the invention. The drawing showed a belt which contained a plurality of parallel slats oriented perpendicular to an axis of rotation.

Patent 619 had a single claim for a motor-less leg-powered treadmill comprising the following:

a) a treadmill frame;
b) front and rear pulley end rollers for rotation;
c) a closed loop belt supported by the pulley end rollers;
d) said closed loop belt comprising a plurality of parallel slats oriented perpendicular to an axis of rotation in which the slats are attached in a resilient fashion;
e) the said closed loop belt having a concave upper contour.

The single claim in Patent 619 further comprised a means for slackening the upper belt portion and simultaneous keeping the lower belt portion taut during rotation and exertion to include walking or running forces on the upper belt portion. The claimed means included the following elements:

a) a timing belt;
b) timing belt pulleys are attached to said front and rear pulley rollers;
c) timing belt idlers are used to configure the said timing belt geometrically;
d) high friction coefficient to prevent the said closed loop treadmill belt from slipping relative to the end rollers;
e) the said timing belt prevents drooping of the said lower taut portion of said closed loop treadmill belt because all respective motion is synchronous.

Patent 016 had 17 claims. Claim 1 claimed a motor-less, leg-powered curved treadmill comprising:

a) a treadmill frame;
b) front and rear pulley end rollers for rotation;
c) a closed loop belt supported by the pulley end rollers;
d) said closed loop belt comprising a plurality of parallel slats oriented perpendicular to an axis of rotation in which the slats are attached in a resilient fashion;
e) the said closed loop belt having a concave upper contour.

Claim 1 in Patent 016 further claimed a means for slackening the upper belt portion and simultaneously keeping the lower belt portion taut during rotation and exertion to include walking or running forces on the upper belt portion.

Claim 1 in Patent 016 also claimed that:

a) said slats are made of material of sufficient resiliency, strength and weight to lie;
b) on a concave row of upper support peripheral ball bearings located at each said side of the treadmill.

The description of Patent 016 contained three methods for slackening the upper belt portion and simultaneously keeping the lower belt portion taut. The three method were documented in the drawings of Patents 619 and 016(**Figure 3).**

The first method, denoted FIG. 2, in **Figure 3**, comprised of a:

a) flat support belt loop;
b) two side pulleys engaged with the said flat support belt loop;
c) a third pulley engaged with the said flat support belt loop and attached to treadmill frame;
d) two springs pulling in opposite directions hold the flat support belt loop taut in contact with closed loop belt bottom portion;
e) the treadmill closed loop belt bottom portion is supported, preventing it from drooping down, by the flat support belt and both belts move together due to a low friction pulley system.

The second method, denoted FIG. 3, in **Figure 3**, comprised of a:

a) a timing belt;
b) timing belt pulleys are attached to said front and rear pulley rollers;
c) timing belt idlers are used to configure the said timing belt geometrically;
d) high friction coefficient to prevent the said closed loop treadmill belt from slipping relative to the end rollers or an additional integral timing belt with rollers and timing belt engagement grooves;
e) the said timing belt prevents drooping of the said lower taut portion of said closed loop treadmill belt because all respective motion is synchronous.

The third method, denoted FIG. 4, in **Figure 3,** comprised of:

a) one or more linear arrays of bearings extending along opposite peripheral edges of said treadmill frame;
b) the said bearings physically support the closed loop treadmill belt lower portion preventing drooping;
c) the said bearings may be ball bearings or straight ball bearing casters attached and located at respective side peripheral edges to the bottom surface of the frame of treadmill.

The provisional patent application disclosed and Patents 619 and 016 claimed common elements of a leg-powered treadmill including: a treadmill frame; front and rear pulley end rollers for rotation; a closed loop belt supported by the pulley end rollers; said closed loop belt having a concave upper contour; said closed loop belt lower section remaining taut, not slacked. The provisional patent application contained a drawing (**Figure 1**) and US patents 619 and 016 claimed a closed loop belt

comprising a plurality of parallel slats oriented perpendicular to an axis of rotation in which the slats are attached.

One advantage of the leg-powered treadmill in both the provisional patent application and Patents 619 and 016 is that the closed loop belt upper contour remains concave and the lower belt portion remains taut while an exerciser loads the closed loop belt cyclically by walking or running. If the closed loop belt does not have a means for remaining taut, then it will lose its concave upper contour and the lower section will not remain taut (**Figure 20**).

The provisional patent application disclosed and Patents 619 and 016 claimed different methods for keeping the lower belt portion taut, but all documents disclosed or claimed a taut lower belt or maintained the upper belt portion in a slackened state. The provisional patent application disclosed springs which were modeled as seen in **Figures 4 through 9**. Patents 619 and 016 claimed multiple methods outlined in this report. The methods were modeled as seen in **Figures 10 through 18**.

The methods of keeping the lower belt portion taut and the upper belt portion concave as claimed in Patents 619 and 016 were mechanical and performed similar as to the method disclosed in the provisional patent application, which disclosed means for maintaining the upper portion of the running belt in a slackened state. All methods keep the lower belt portion taut and the upper belt portion concave during cyclical loading as seen in walking or running.

CONCLUSIONS

Based on BFPC's investigation and analysis, the following has been determined:

1. The provisional patent application disclosed and Patents 619 and 016 claimed common elements of a leg-powered treadmill including: a treadmill frame; front and rear pulley end rollers for rotation; a closed loop belt supported by the pulley end rollers; said closed loop belt having a concave upper contour; said closed loop belt lower section remaining taut, not slacked.

2. One advantage of the leg-powered treadmill in both the provisional patent application and Patents 619 and 016 is that the closed loop belt upper contour remains concave and the lower belt portion remains taut while an exerciser loads the closed loop belt cyclically by walking or running.

3. The provisional patent application disclosed and Patents 619 and 016 claimed different methods for keeping the lower belt portion taut, but all documents disclosed or claimed a taut lower belt or maintained the upper belt portion in a slackened state.

4. The methods of keeping the lower belt portion taut and the upper belt portion concave as claimed in Patents 619 and 016 were mechanical and performed similar as to the method disclosed in the provisional patent application, which disclosed means for maintaining the upper portion of the running belt in a slackened state.

SIGNATURES

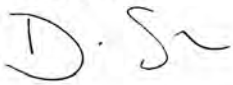
This report contains opinions and conclusions that are based on the information available at this time. The conclusions are made with a reasonable degree of professional certainty and based on reliable principles in combination with my knowledge, skill, education, training and experience. Should additional information become available, the right to add to this report is reserved should it become necessary.

Beacon Forensic, P.C. appreciates this opportunity to provide consulting services in this matter. Please contact us should any questions arise concerning this report, or if we may be of further assistance.

Respectfully submitted,

James D. Whelan, P.E.
Principal Engineer
State of New York
License No. 093646

Reviewed by:



David Stobbe, MSME
Consulting Mechanical Engineer

ENCLOSURES

Appendix A

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
61/280,265	11/02/2009		110	P-4096-38A		

CONFIRMATION NO. 5543

FILING RECEIPT

Myron Amer, Esq.
Myron Amer, P.C.
Suite 2B
350 National Boulevard
Long Beach, NY 11561-3327

OC000000038781519

Date Mailed: 11/18/2009

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Aurel A. Astilean, East Hampton, NY;

Power of Attorney:
Myron Amer--18650

If Required, Foreign Filing License Granted: 11/16/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/280,265**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

Leg-powered treadmill

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international

patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and

Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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U.S. PTO
61/280265
11/02/2009

17439
U.S. PTO
110209

Myron Amer, P.C.
Attorney at Law
Patents, Trademarks, Copyrights

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E-Mail ma@myronamer.com

October 29, 2009

Box Provisional Patent Application
Assistant Commissioner of Patents
Alexandria, VA 22313-1450

Re: Filing of Provisional Patent Application
for Applicant Aurel A. Astilean
for LEG-POWERED TREADMILL
Our File No. P-4096-38A

Dear Sir:

Enclosed for filing are the following:

1. Provisional Patent Application for LEG-POWERED TREADMILL;
2. Drawing;
3. Filing fee check in the amount of $110.00; and
4. Self-addressed, return postcard.

Respectfully,

MYRON AMER

MA/sc
Enclosures

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Box Provisional Patent Application, Assistant Commissioner of Patents, Alexandria, VA 22313-1450, on October 29, 2009.

Signed: Susan Capellini
Susan Capellini

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

LEG-POWERED TREADMILL

Cover Sheet For Filing Provisional Application
37 CFR 1.53(c)

Box Provisional Patent Application
Assistant Commissioner of Patents
Alexandria, VA 22313-1450

Sir:

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.539(c). The suggested classification and Technology Center is not known.

1. The following comprises the information required by 37 CFR 1.51(c).

2. The name of the inventor is:

   AUREL A. ASTILEAN

3. Residence address of the inventor is:

   323 Georgica Road
   East Hampton, NY 11937

4. The title of the invention is:

   LEG-POWERED TREADMILL

5. The name, registration and telephone number of the attorney is:

Myron Amer, Esq.
Registration No. 18,650
(516) 670-9820

6. The docket number used to identify this application is:

P-4096-38A

7. The correspondence address for this application is:

Myron Amer, Esq.
Myron Amer, P.C.
350 National Boulevard, Suite 2B
Long Beach, NY 11561-3327

8. Domestic Priority Information:

Provisional Patent Application Serial No. 61/193,239 for LEG-POWERED TREADMILL filed November 7, 2008.

9. Identification of documents accompanying this cover sheet:

A. Documents required by 37 CFR 1.51(c)(2) and 37 CFR 1.51(c)(3):

LEG-POWERED TREADMILL

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWING

The description of the invention which follows, together with the accompanying drawing should not be construed as limiting the invention to the example shown and described, because those skilled in the art to which this invention appertains will be able to devise other forms thereof.

Fig. 1 is a perspective view of a leg-powered treadmill constructed and having an operating mode according to the present invention.

Illustrated are two leg supports 10 and 12 which lift the treadmill 14 in a clearance position above a support surface 16, said treadmill 10 having space apart sides 18 and 20 which have journalled for rotation end rollers 22 and 24 which support a closed loop treadmill belt 26. Springs (not shown) exert spring urgency in opposite directions holding taut the length of the lower belt portion 26A in a dimension of approximately twenty-three inches denoted by arrow 30 and in the upper belt portion 26B weighing approximately forty pounds, denoted by the arrow 30.

It is to be noted that an essential feature of treadmill 10 is a concave shape subtending an acute angle 34 in the treadmill 10 front end 14A which in practice results in the exerciser 36 running uphill and concomitantly exerting body weight 38 that contributes to driving lengthwise 40 in the direction 42 in which the exerciser runs and achieves the benefits of the exercise.

It is known from common experience that in prior art treadmills, the upper length portion of their closed loops are flat due, it is believed, because of the inability to maintain the

concave shape 34 in the length portion 26B. This shortcoming is overcome by the weight 30 which in practice has been found to hold the concave shape 34 during the uphill running of the exerciser 36.

9. Fee: **The filing fee for this provisional application is $110.00 and is enclosed herewith**.

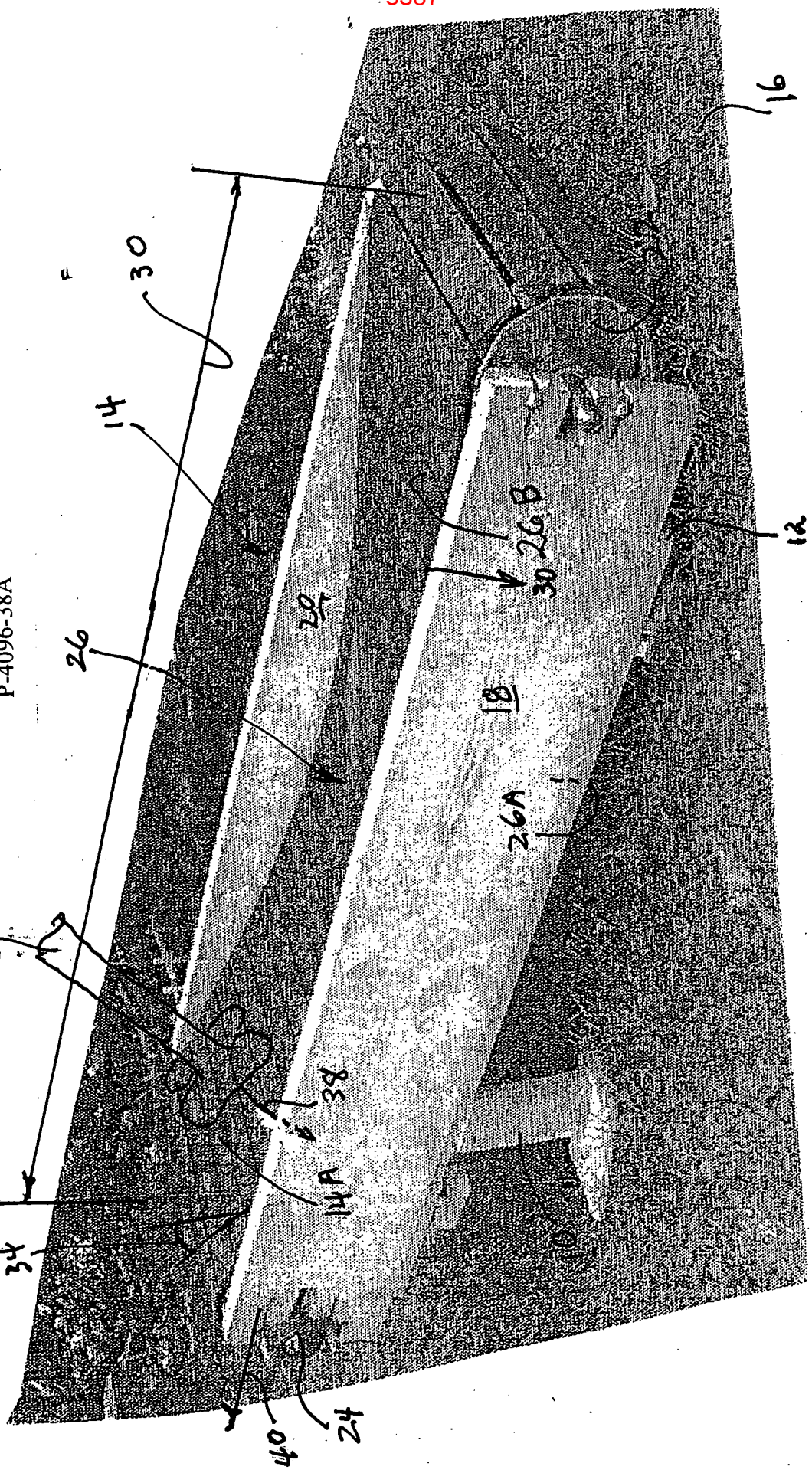

Fig. 1

New Provisional Application
P-4096-38A
11

PATENT APPLICATION SERIAL NO._____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

11/03/2009 HALI33 00000016 61280265
01 FC:2005 110.00 OP

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002- 489-267/69033

Appendix B

Beacon Forensic, P.C.
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US008308619B1

(12) **United States Patent**
Astilean

(10) **Patent No.: US 8,308,619 B1**
(45) **Date of Patent: Nov. 13, 2012**

(54) **LEG-POWERED TREADMILL**

(76) Inventor: **Aurel A. Astilean**, East Hampton, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 146 days.

(21) Appl. No.: **12/925,770**

(22) Filed: **Oct. 29, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/280,265, filed on Nov. 2, 2009.

(51) **Int. Cl.**
A63B 22/02 (2006.01)

(52) **U.S. Cl.** **482/54**

(58) **Field of Classification Search** 482/23, 482/37, 51, 54, 69–71, 79; 119/700; 434/247, 434/255; D21/662, 668–669; *A63B 22/02*
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,211,765	A *	1/1917	Schmidt	482/54
3,489,408	A *	1/1970	Goodrich	472/89
3,637,206	A *	1/1972	Chickering, III	482/54
3,642,279	A	2/1972	Cutter	
3,669,238	A *	6/1972	Folkes et al.	198/805
4,614,337	A	9/1986	Schonenberger	
5,470,293	A	11/1995	Schonenberger	
5,577,598	A	11/1996	Schoenenberger	
5,709,632	A	1/1998	Socwell	
6,053,848	A	4/2000	Eschenbach	
6,146,315	A	11/2000	Schonenberger	
6,348,025	B1	2/2002	Schonenberger	
2012/0010048	A1 *	1/2012	Bayerlein et al.	482/2
2012/0010053	A1 *	1/2012	Bayerlein et al.	482/54
2012/0157267	A1 *	6/2012	Lo	482/54

OTHER PUBLICATIONS

Aurel Astilean , Speedboard, Curved treadmill with taut bottom belt portion and curved top belt portion configured with timing belt on Discovery Channel "Wreckreation" television show in Jan. 2009.
Aurel Astilean, Speedboard, Curved treadmill with taut bottom belt portion and curved top belt portion configured with timing belt at IHRSA trade show in Mar. 2009.
Aurel Astilean Speedboard Curved treadmill with taut bottom belt portion and curved top belt portion configured with timing belt at FIBO trade show in Germany Apr. 2009.

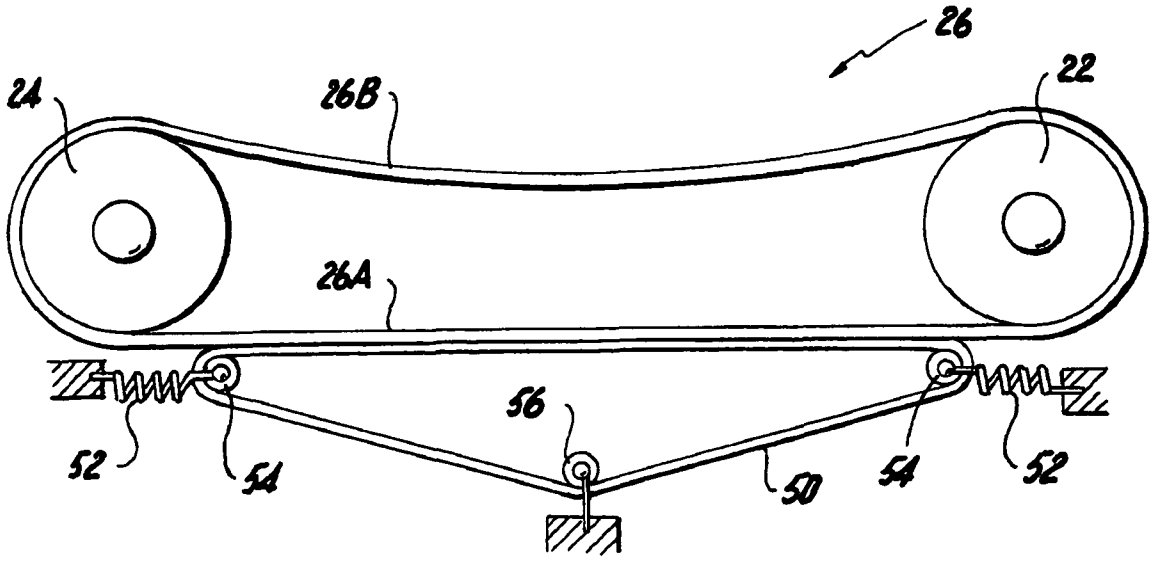
* cited by examiner

Primary Examiner — Loan Thanh
Assistant Examiner — Oren Ginsberg
(74) *Attorney, Agent, or Firm* — Alfred M. Walker; Myron Amer

(57) **ABSTRACT**

A motor-less leg-powered curved treadmill produced that allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards. A closed loop treadmill belt is formed with a low friction running surface of transverse wooden, plastic or rubber slats attached to each other in a resilient fashion. Since an essential feature of treadmill is the concave shape of the running surface of belt in its respective upper portion, methods are used to insure that this shape is maintained during actual use. These methods prevent the lower portion of the treadmill belt from drooping down (i.e.—it must be held taut), to prevent the top portion to be pulled taut into a flat shape between the front and rear pulley rollers.

1 Claim, 4 Drawing Sheets



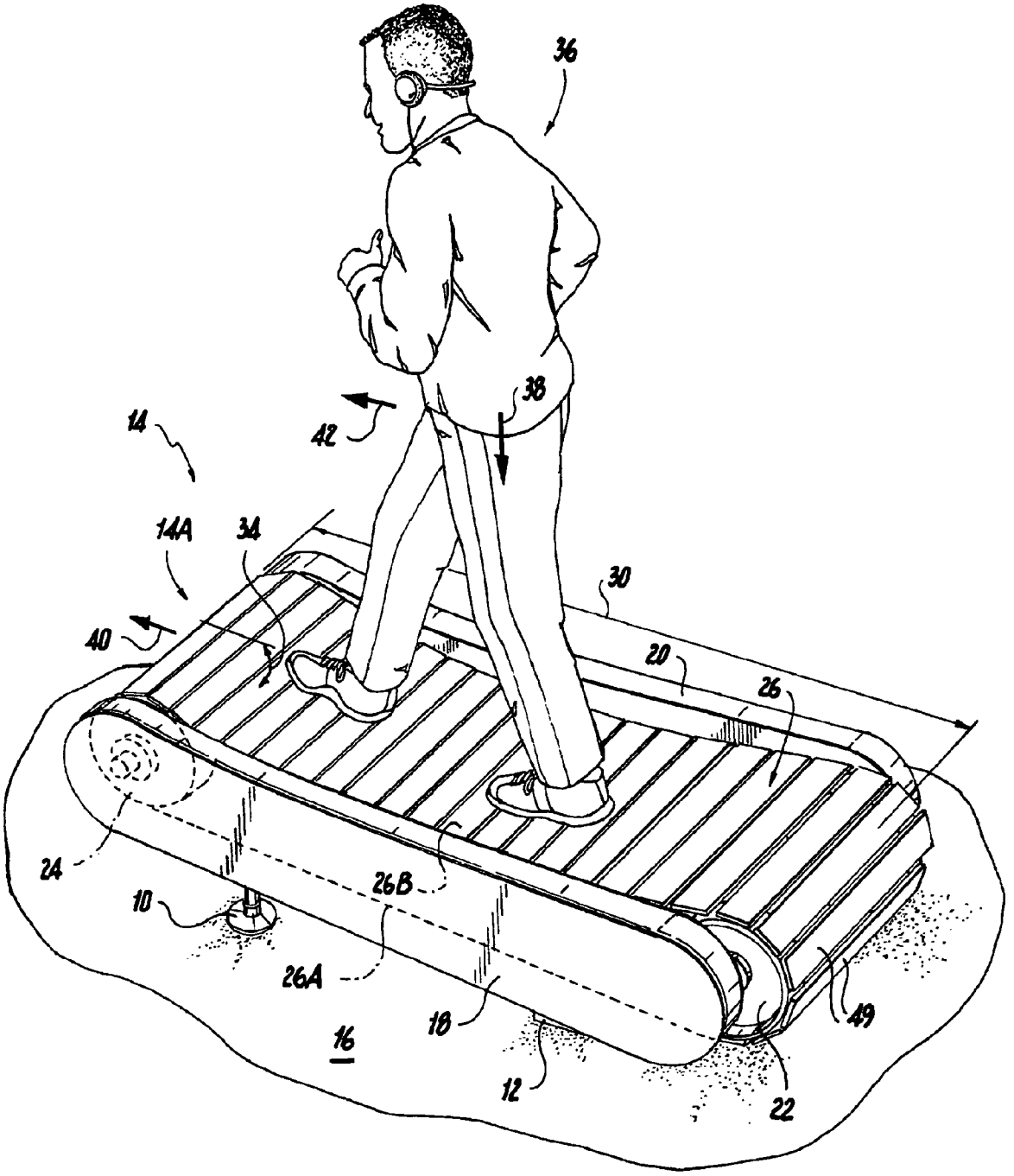


Fig. 1

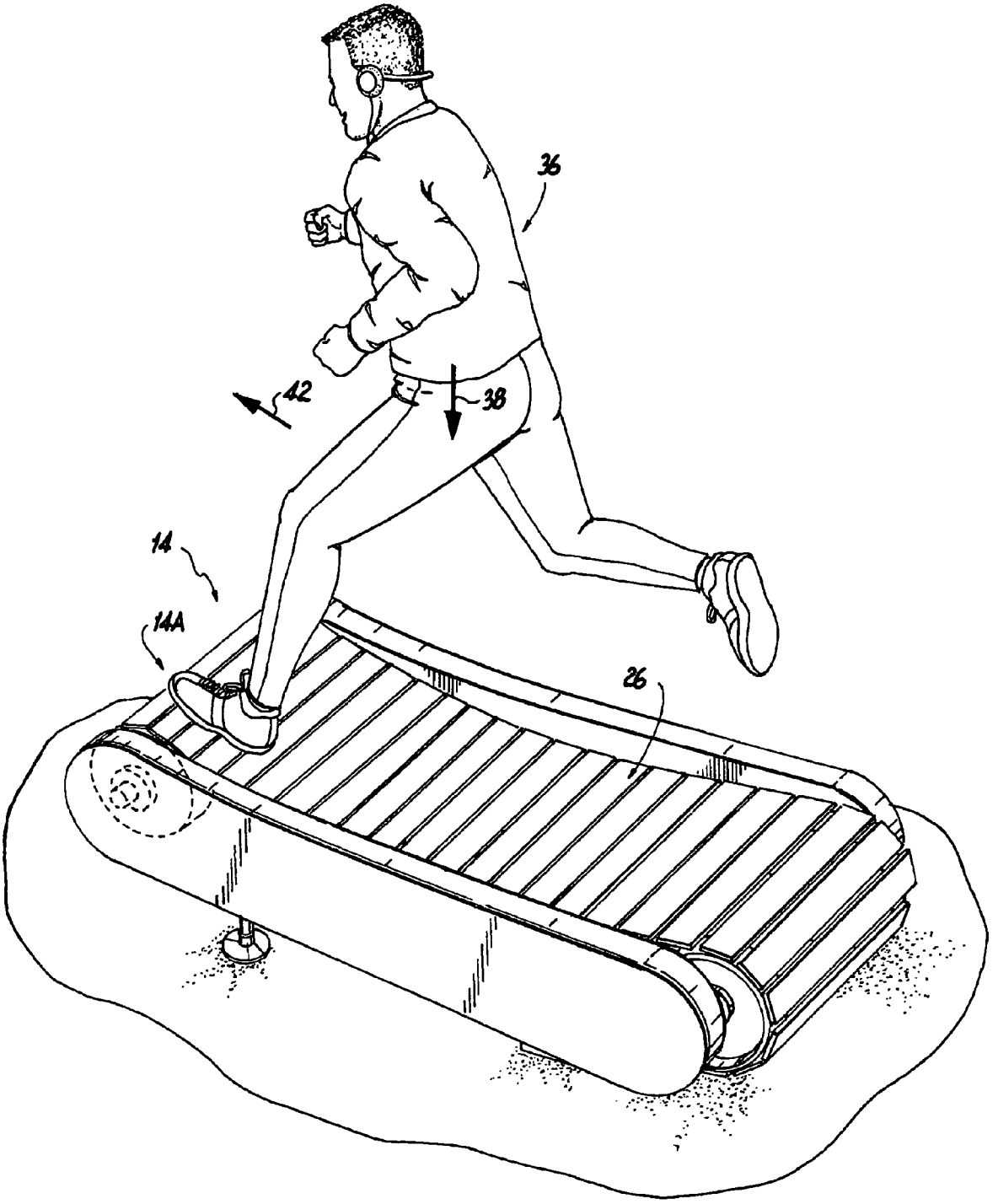


Fig. 1A

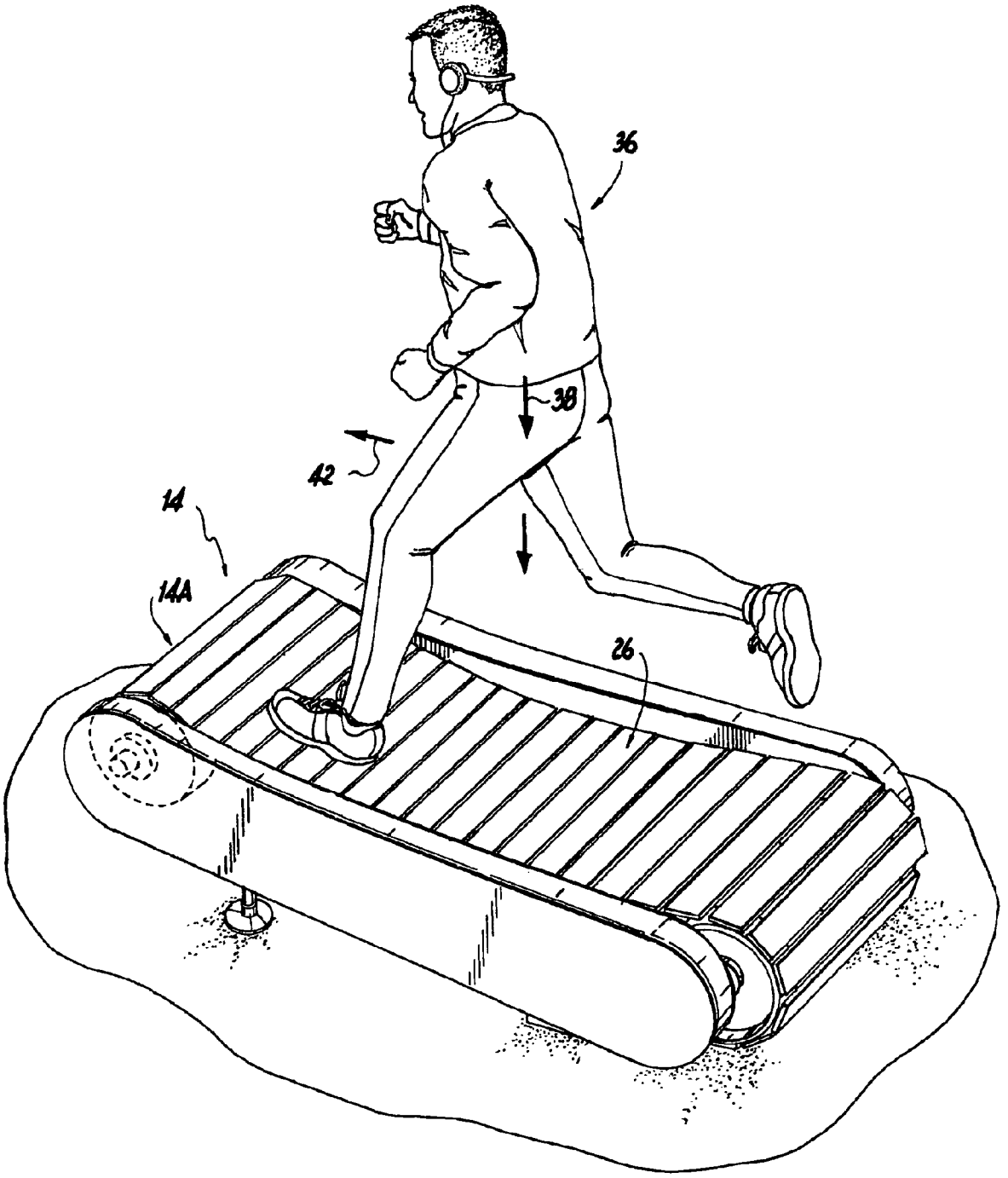


Fig. 1B

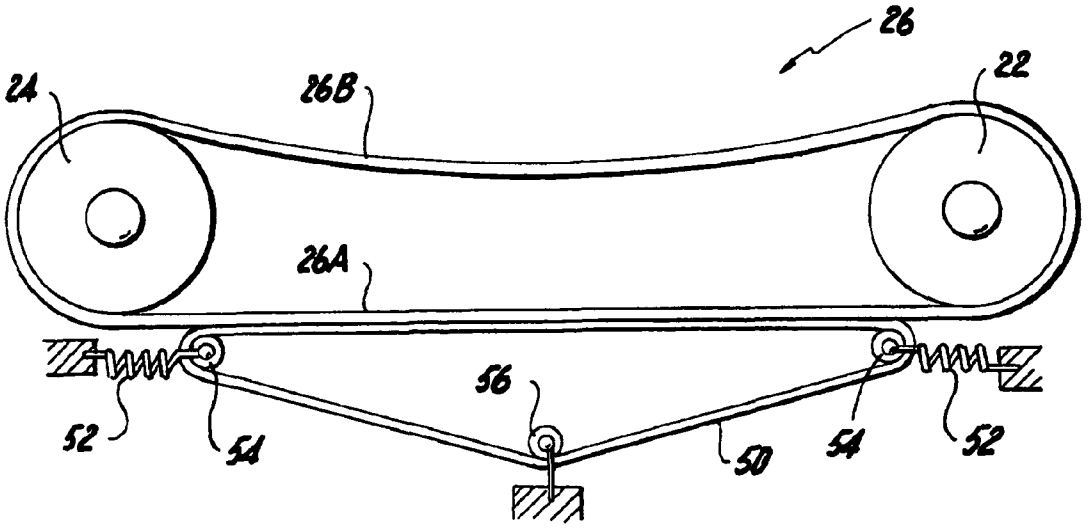


Fig. 2

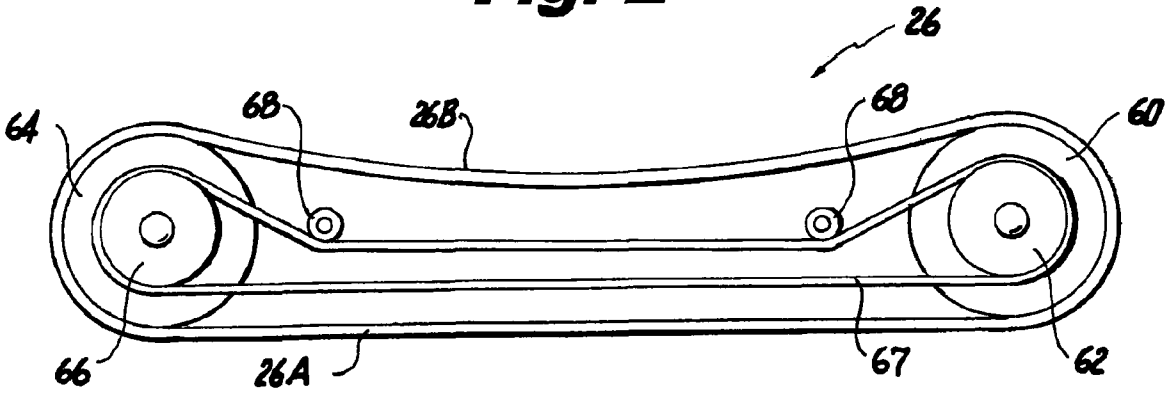


Fig. 3

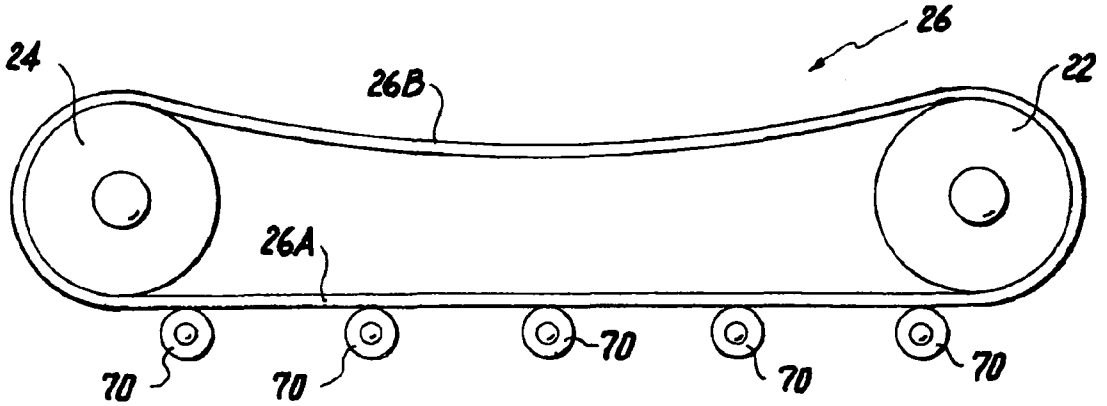


Fig. 4

LEG-POWERED TREADMILL

RELATED APPLICATIONS

This application claims benefit in part under 35 U.S.C. 119(e) from provisional Application No. 61/280,265 filed Nov. 2, 2009, the entire disclosure of which is incorporated by reference herein.

FIELD OF THE INVENTION

The present invention relates to a motor-less leg-powered treadmill produced that allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards.

BACKGROUND OF THE INVENTION

Exercise treadmills allow people to walk, jog, run, and sprint on a stationary machine with an endless belt moving over a front and rear sets of pulleys.

OBJECTS OF THE INVENTION

It is an object of the present invention to provide a motor-less leg-powered curved treadmill produced that allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards.

It is also an object of the present invention to provide a closed loop curved treadmill belt in a concave shape supported by end rollers in a low friction manner in a substantial stationery frame.

It is also an object of the present invention to provide a curved treadmill that assumes a concave upper contour and a taut lower portion.

Other objects which become apparent from the following description of the present invention.

SUMMARY OF THE INVENTION

The present invention is a motor-less leg-powered curved treadmill produced wherein the curved, low friction surface allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards. This novel speed control due to the curve allows people of any weight and size to adjust their own speed in fractions of a second. The user controls the speed by positioning their body along the curved running surface. Stepping forward initiates movement, as the user propels themselves up the curve the speed increases. To slow down, the user simply drifts back towards the rear curve. For running athletes, no handrails are needed. Handrails are optional for non-athletes with balance or stability limitations. The motor-less leg-powered treadmill permits low foot impact on the running surface through it's new design, forcing the user to run correctly on the ball of the feet and therefore reducing pressure ands strain of the leg joints. This unique design of the curve in a low friction surface allows any user, regardless of weight and size, to find and maintain the speed they desire. The user steps on the concave curved treadmill belt section and begins walking, steps up further and begins running, steps up even farther and starts to sprint. When stepping backward the motor-less leg-powered treadmill will stop.

Utilizing a closed loop treadmill belt supported by end rollers in a low friction manner in a substantial stationery frame, the curved treadmill of this invention makes it possible for the user to experience a free running session, with the potential to have the real feeling of running, and the ability to stop and sprint and walk instantly, thereby simulating running outside on a running track. This novel speed control in running was not possible in the prior art because of the lack of curved low friction running surfaces.

The closed loop treadmill belt must be of such a length as compared to the distance between the end rollers to permit it to assume the required concave upper contour. To keep it in that configuration in all operational modes, a method of slackening the curved upper portion while simultaneously keeping the lower portion taut (i.e.—preventing it from drooping down) is used. This method must not add significant friction to the treadmill belt since this would detract from the running experience of the user.

Several methods of controlling the treadmill belt configuration in a low friction manner are described. One method is to use a support belt under the treadmill belt lower portion. This support belt is kept in a taut configuration with a horizontal section by using springs pulling pulleys in opposite directions.

Another method uses a timing belt linking the treadmill belt end rollers such that after the desired configuration is achieved, the treadmill belt and end rollers must move synchronously thereby denying the treadmill belt the opportunity to have its lower section droop down.

Yet another method is to support the lower section of the treadmill belt from drooping down by directly supporting this section with one or more linear arrays of low friction bearings at the peripheral edges of the belt below the lower section.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can best be understood in connection with the accompanying drawings. It is noted that the invention is not limited to the precise embodiments shown in drawings, in which:

FIG. **1** is a perspective view of the exterior of one embodiment of the present invention; showing the runner in a slow walk in the droop of the concave upper portion of the treadmill ball.

FIG. **1**A is a perspective view of the exterior of the embodiment in FIG. **1**, showing the runner running at a fast pace uphill.

FIG. **1**B is a perspective view of the exterior of the embodiment in FIG. **1**, showing the runner running slowly in the droop of the concave portion.

FIG. **2** is a diagrammatic side view of the system components for the embodiment of FIG. **1** for implementing the present invention.

FIG. **3** is a diagrammatic side view of the system components for a second embodiment for implementing the present invention.

FIG. **4** is a diagrammatic side view of the system components for a third embodiment for implementing the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

The description of the invention which follows, together with the accompanying drawing should not be construed as limiting the invention to the example shown and described, because those skilled in the art to which this invention appertains will be able to devise other forms thereof.

FIG. **1** is a perspective view of a leg-powered treadmill **10** constructed and having an operating mode according to the present invention.

As noted in FIG. **1**, no hand rails are shown. The curved treadmill **10** can be used without hand rails. Hand rails can be optionally provided for non-athletes with balance or running stabilities limitations.

Illustrated are two leg supports **10** and **12** which lift the treadmill **14** in a clearance position above a support surface **16**, said treadmill **10** having space apart sides **18** and **20** which have journalled for rotation end rollers **22** and **24** which support a closed loop treadmill belt **26**. Low friction methods to be described are used to hold taut the length of the lower belt portion **26**A in a dimension of approximately forty-three inches denoted by dimension line **30**. The upper belt portion **26**B weighs approximately forty pounds is also denoted by the dimension line **30**.

It is to be noted that an essential feature of treadmill **10** is a concave shape subtending an acute angle **34** in the treadmill **10** front end **14**A which in practice results in the exerciser **36** running uphill and concomitantly exerting body weight **38** that contributes to driving lengthwise **40** in the direction **42** in which the exerciser runs and achieves the benefits of the exercise. As the runner **36** encounters the different positions on the treadmill belt **26** of the treadmill **14**, the angle of the surface of running changes For example, as shown in FIG. **1**, when the center of gravity of body weight, indicated by downward directional arrow **38**, below the hips of the user **36**, is in the lower dropping portion of the concave upper portion **26**B of the treadmill belt **26**, the runner **36** walks or slowly jogs in a generally horizontal orientation, as indicated by directional arrow **42** in a first slow jogging speed. But, as shown in FIG. **1**A, as the runner **36** speeds up and advances the runner's hips and center of gravity of body weight further forward up the angled slope at the front end **14**A of the treadmill belt **26**, the angle of movement **42** changes from a generally horizontal angle **42** in FIG. **1** to an acute angle **42** up off the horizontal as in FIG. **1**A, which concurrently causes the runner **36** to run vigorously faster, at the acute angle **42** up the slope of the front **14**A of the concave curve of upper belt portion **26**B of treadmill belt **26**, the runner **36** runs faster uphill. Furthermore, as shown in FIG. **1**B, it does not matter where the runner **36** puts the forward foot to change the speed. In FIG. **1**B the center of gravity in the hip region of the runner **36**'s body weight, indicated by downward directional arrow **38**, is still in the lower part of the concave droop of the upper portion **26**A of treadmill belt **26**. So even though the runner **36** in FIG. **1**B is jogging faster than walking or slowly jogging as in FIG. **1**, so long as the runner **36** has the forward foot partially up the angled slope of the forward portion **14**A of the upper belt portion **26**B, the runner will still run slower in FIG. **1**B, not because the forward foot is up the slope of upper belt portion **26**B of the treadmill belt **26**, but because the center of gravity of body weight, as indicated by downward directional arrow **38**, is still within the lower confines of the droop of the concave upper belt portion **26**B. Therefore, what changes the speed of the runner **36** and the treadmill belt **26**, is when the runner **36** moves the center of gravity of the hips of the body weight indicated by downward directional arrow **38** higher up the slope of concave upper portion **26**B of treadmill belt **26**, which causes the runner to run faster and the belt **26** to concurrently move faster around pulleys **22** and **24** with the pace of the forward advancing runner **36**.

It is known from common experience that in prior art treadmills, the upper length portion of their closed loops are flat due, it is believed, because of the inability to maintain the concave shape **34** in the length portion **26**B. This shortcoming

is overcome by the weight **30** which in practice has been found to hold the concave shape **34** during the uphill running of the exerciser **36**.

A closed loop treadmill belt **26** is formed with a running surface of transverse wooden, plastic or rubber slats **49** (see FIG. **1**) attached to each other in a resilient fashion. Since an essential feature of treadmill **10** is the concave shape of the low friction running surface of belt **26** in upper portion **26**B, methods are used to insure that this shape is maintained during actual use. These methods must prevent the lower portion **26**A of treadmill belt **26** from drooping down (i.e.—must be held taut), otherwise top portion **26**B would be pulled taut into a flat shape between rollers **22** and **24**. Three methods are illustrated by the side view schematic drawings of FIGS. **2**-**4**.

The method of FIG. **2** shows a flat support belt loop **50** engaged with two side pulleys **54** and a third pulley **56** which is attached to treadmill **10** frame. Two springs **52** pulling in opposite directions hold belt **50** taut with a flat top configuration in contact with bottom treadmill belt portion **26**A. Since pulleys **54** and **52** are low friction, and there is no relative movement between belt **50** and belt **26**, belt **50** imposes very little drag on belt **26** while supporting lower belt portion **26**A vertically preventing it from drooping down.

The method shown in FIG. **3** shows the use of a timing belt **67** in achieving a similar result. Here end rollers **60** and **64** are attached to timing belt pulleys **62** and **66** respectively. Timing belt idlers **68** are simply used to configure timing belt geometrically to fit within the constraints of the side contours of treadmill **10**. If belt **26** is prevented from slipping relative to end rollers **60** and **64** by high friction coefficient (or by the use an integral timing belt on the inside of belt **26** and rollers with timing belt engagement grooves), once configured as shown, timing belt **67** will not permit drooping down of section **26**A since all motion is now synchronous.

In another method shown in FIG. **4**, one or more linear arrays of bearings **70** extending along opposite peripheral edges of said treadmill frame physically support lower section **26**A of treadmill belt **26** thereby preventing drooping. Bearings **70** may be ball bearings or straight ball bearing casters attached and located at respective side peripheral edges to the bottom surface of the frame of treadmill **10**.

In the foregoing description, certain terms and visual depictions are used to illustrate the preferred embodiment. However, no unnecessary limitations are to be construed by the terms used or illustrations depicted, beyond what is shown in the prior art, since the terms and illustrations are exemplary only, and are not meant to limit the scope of the present invention.

It is further known that other modifications may be made to the present invention, without departing the scope of the invention, as noted in the appended Claims.

I claim:

1. A motor-less, leg-powered treadmill comprising:

a treadmill frame;

a set of respective front and rear pulley end rollers for rotation, said front and rear pulleys supporting a closed loop treadmill belt;

said closed loop treadmill belt comprising a plurality of parallel slats oriented perpendicular to an axis of rotation of said belt, said parallel slats attached to each other in a resilient fashion;

said closed loop treadmill belt being of such a length as compared to the distance between the end rollers to permit it to assume a required concave upper contour;

a means for slackening an upper concave portion of said closed loop treadmill belt while simultaneously keeping

a lower portion of said closed loop treadmill belt taut, preventing said lower portion from drooping down during rotation and exertion of walking or miming force upon said upper concave portion of said closed loop treadmill belt, said means for slackening the upper portion while simultaneously keeping the lower portion taut, preventing said lower portion from drooping down during rotation and exertion of walking or running force upon said upper concave portion of said closed loop treadmill belt comprises a timing belt having respective timing belt pulleys attached to said front and rear pulley rollers for said closed loop treadmill belt, wherein timing belt idlers are used to configure said timing belt geometrically to fit within constraints of side contours of said treadmill, wherein if said closed loop treadmill belt is prevented from slipping relative to said end rollers by a high friction coefficient, once configured, said timing belt will not permit drooping down of said lower taut portion of said closed loop treadmill belt because all respective motion is synchronous.

* * * * *

Appendix C

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US008343016B1

(12) **United States Patent**
Astilean

(10) **Patent No.: US 8,343,016 B1**
(45) **Date of Patent: Jan. 1, 2013**

(54) **LEG-POWERED TREADMILL**

(76) Inventor: **Aurel A. Astilean**, East Hampton, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 156 days.

(21) Appl. No.: **12/925,892**

(22) Filed: **Nov. 1, 2010**

Related U.S. Application Data

(63) Continuation-in-part of application No. 12/925,770, filed on Oct. 29, 2010.

(60) Provisional application No. 61/280,265, filed on Nov. 2, 2009.

(51) **Int. Cl.**
A63B 22/02 (2006.01)

(52) **U.S. Cl.** **482/54**

(58) **Field of Classification Search** 482/23, 482/37, 51, 54, 69–71, 79; 119/700; 434/247, 434/255; D21/662, 668–669; *A63B 22/02*
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,211,765	A *	1/1917	Schmidt	482/54
3,489,408	A *	1/1970	Goodrich	472/89
3,637,206	A *	1/1972	Chickering, III	482/54
3,642,279	A	2/1972	Cutter	
3,669,238	A *	6/1972	Folkes et al.	198/805
4,614,337	A	9/1986	Schonenberger	
5,470,293	A	11/1995	Schonenberger	
5,577,598	A	11/1996	Schoenenberger	
5,709,632	A	1/1998	Socwell	
6,053,848	A	4/2000	Eschenbach	
6,146,315	A	11/2000	Schoenenberger	
6,348,025	B1	2/2002	Schonenberger	
2012/0010048	A1 *	1/2012	Bayerlein et al.	482/2
2012/0010053	A1 *	1/2012	Bayerlein et al.	482/54
2012/0157267	A1 *	6/2012	Lo	482/54

OTHER PUBLICATIONS

Aurel Astilean , Speedboard, Curved treadmill with taut bottom belt portion and curved top belt portion configured with timing belt on Discovery Channel "Wreckreation" television show in Jan. 2009.
Aurel Astilean, Speedboard, Curved treadmill with taut bottom belt portion and curved top belt portion configured with timing belt at IHRSA trade show in Mar. 2009.
Aurel Astilean Speedboard Curved treadmill with taut bottom belt portion and curved top belt portion configured with timing belt at FIBO trade show in Germany Apr. 2009.

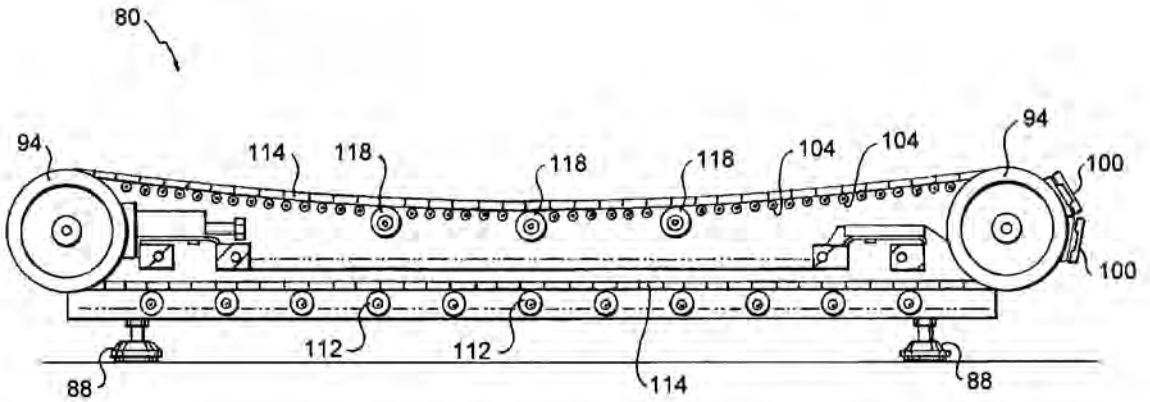
* cited by examiner

Primary Examiner — Oren Ginsberg
(74) *Attorney, Agent, or Firm* — Alfred M. Walker; Myron Amer

(57) **ABSTRACT**

A motor-less leg-powered curved treadmill produced that allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards. A closed loop treadmill belt is formed with a low friction running surface of transverse wooden, plastic or rubber slats attached to each other in a resilient fashion. Since an essential feature of treadmill is the concave shape of the running surface of belt in its respective upper portion, curved and linear arrays of bearings are used to insure that this shape is maintained during actual use. These bearings prevent the lower portion of the treadmill belt from drooping down (i.e.—it must be held taut), to prevent the top portion to be pulled taut into a flat shape between the front and rear pulley rollers.

17 Claims, 8 Drawing Sheets



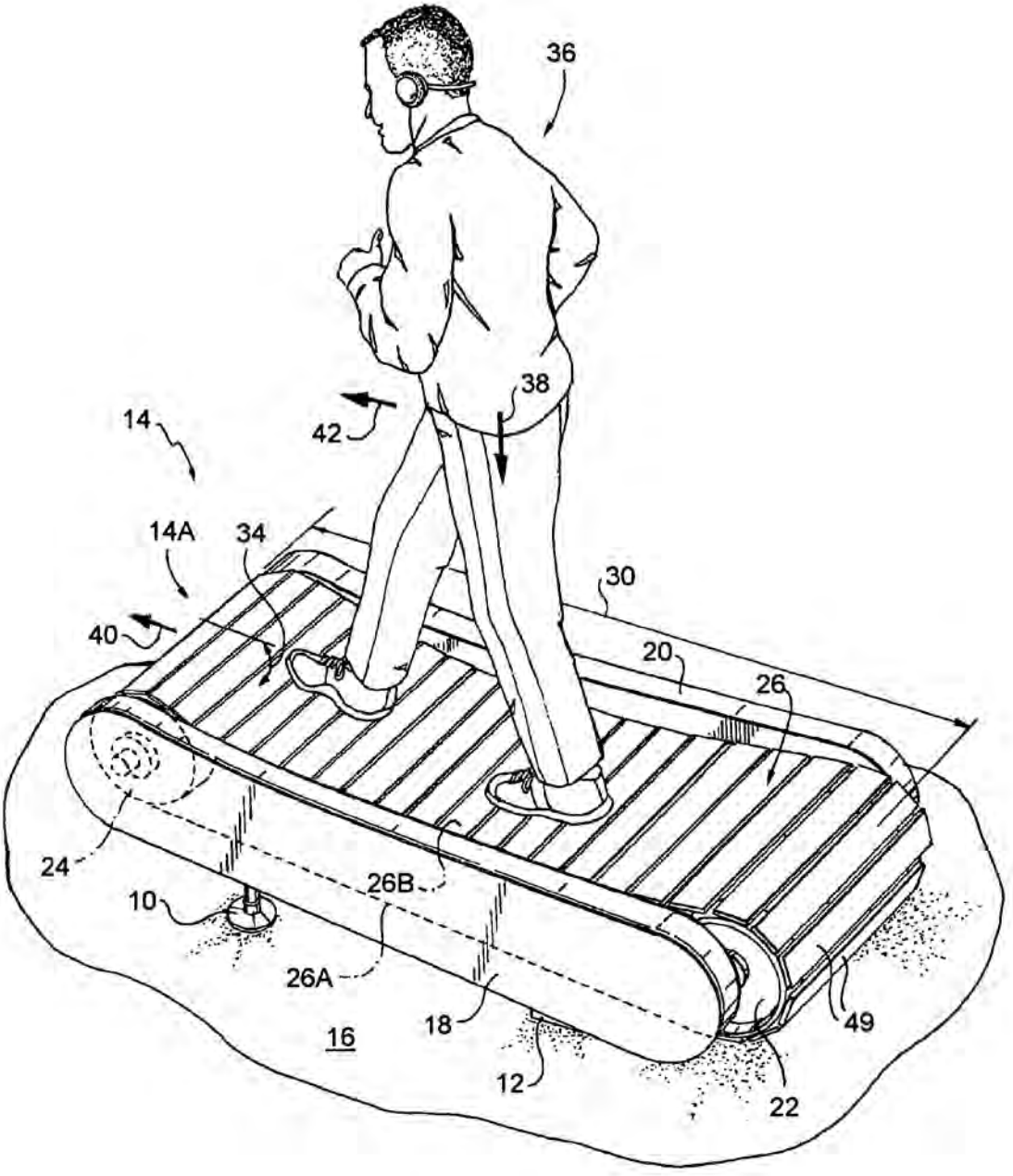


Fig. 1

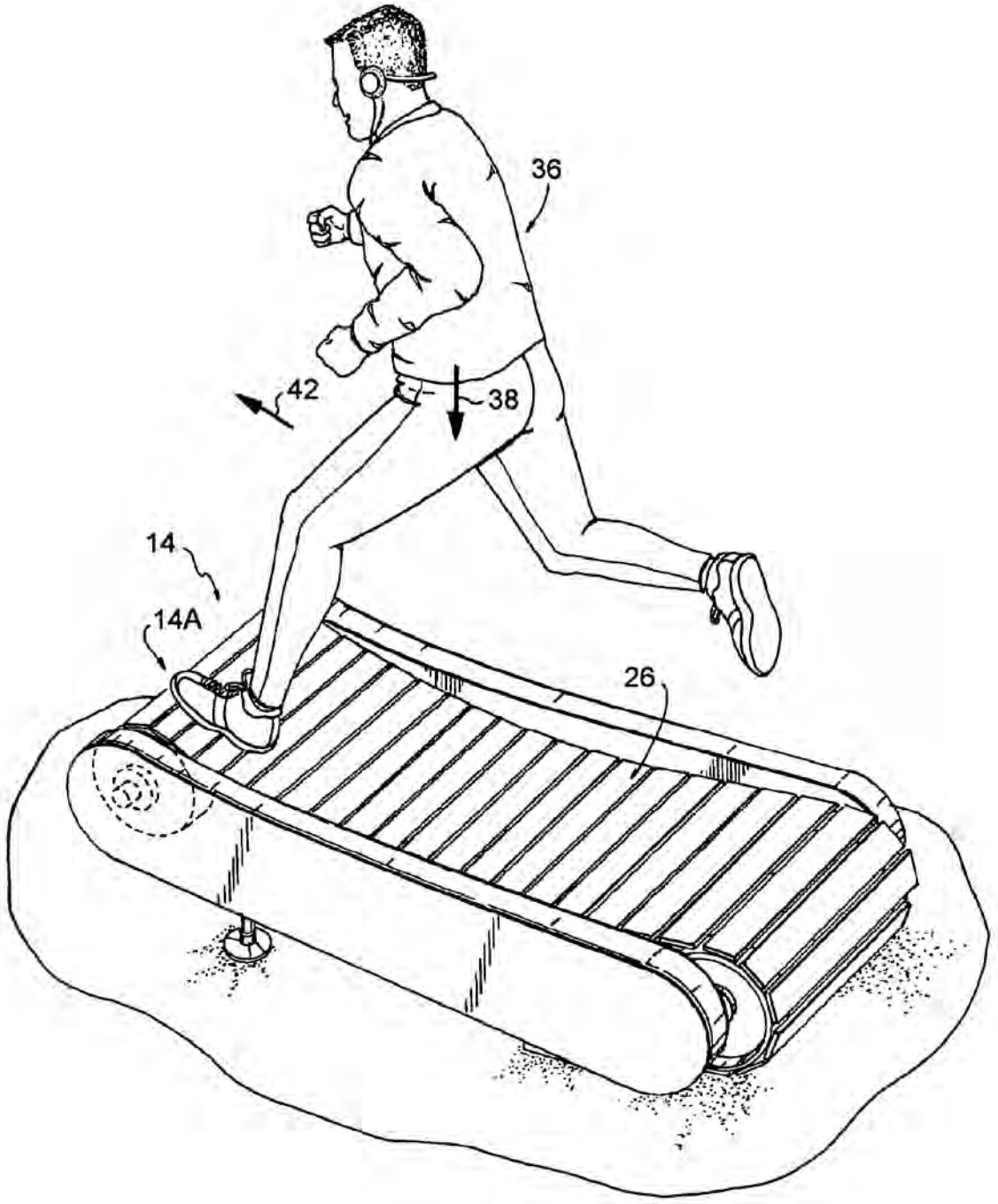


Fig. 1A

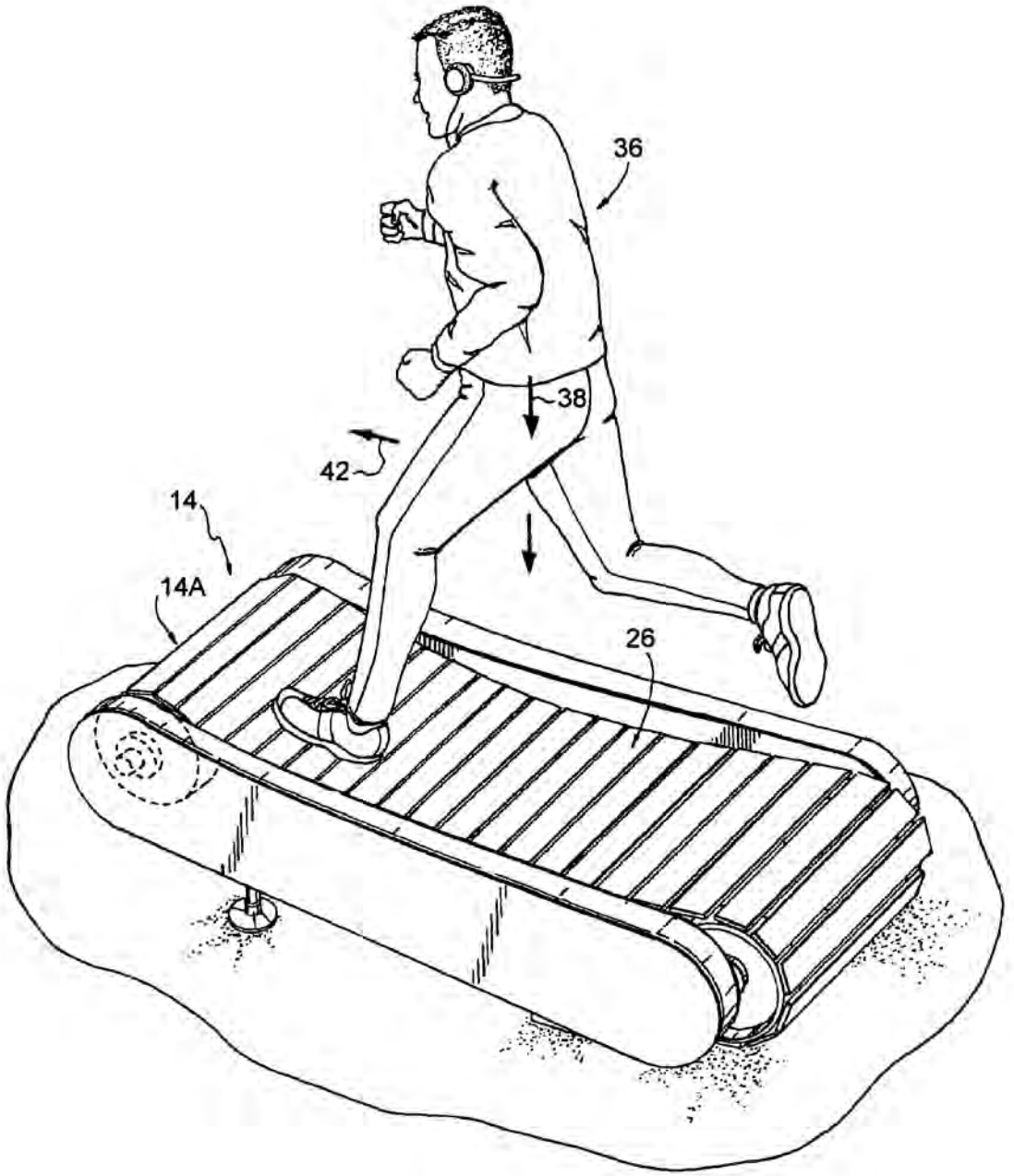


Fig. 1B

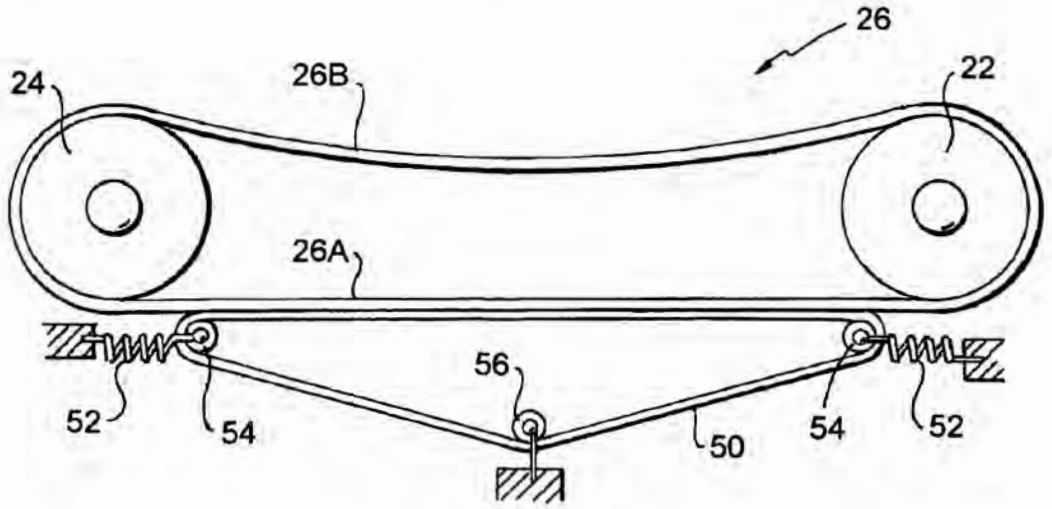


Fig. 2

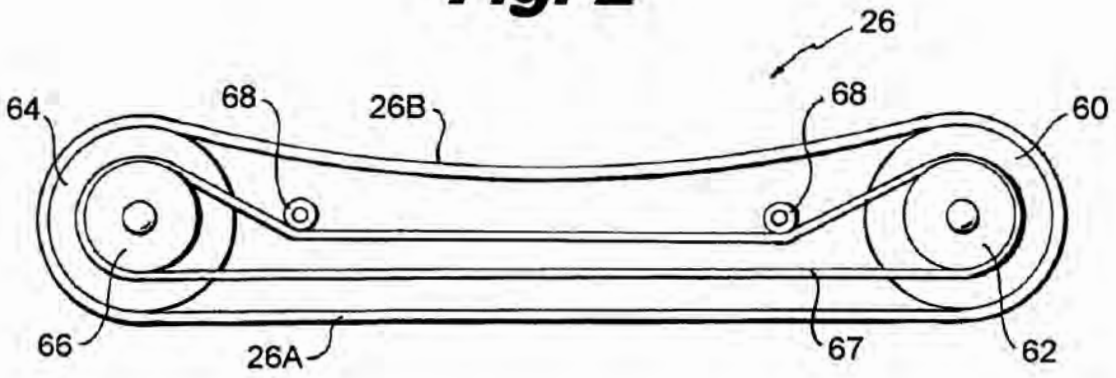


Fig. 3

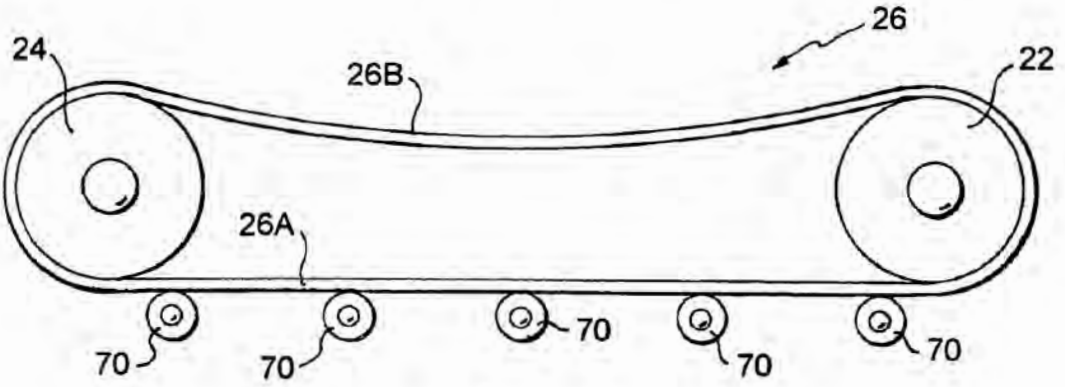


Fig. 4

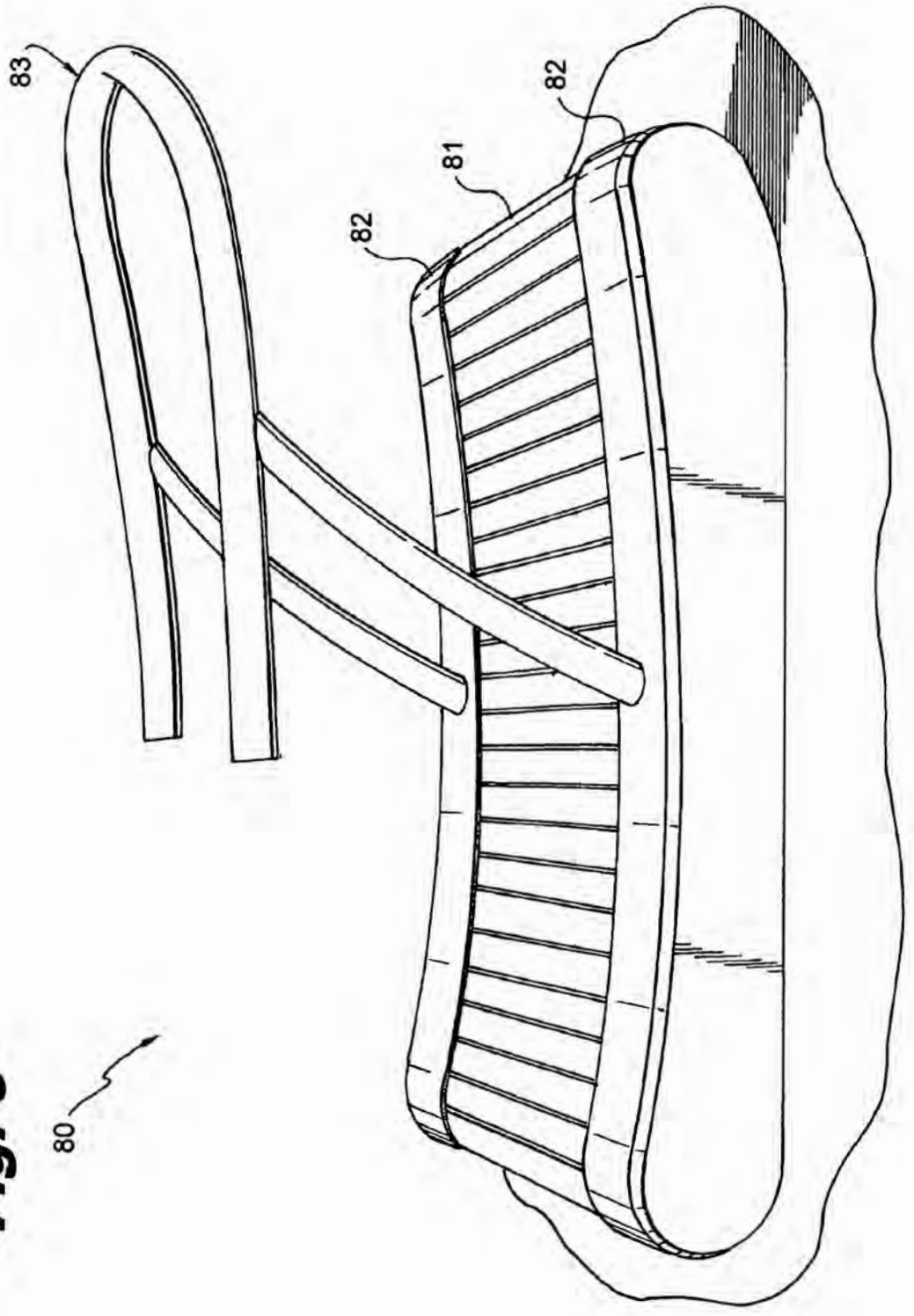


Fig. 5

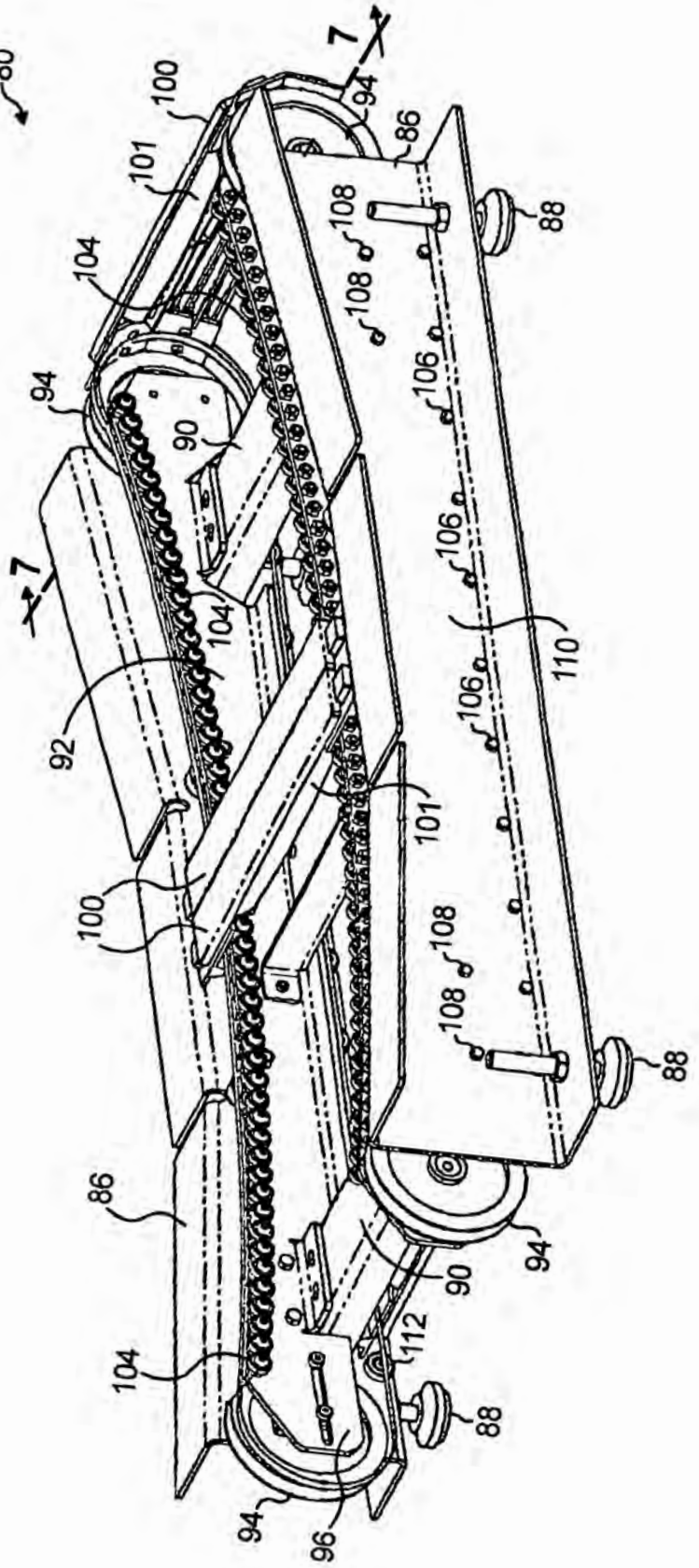


Fig. 6

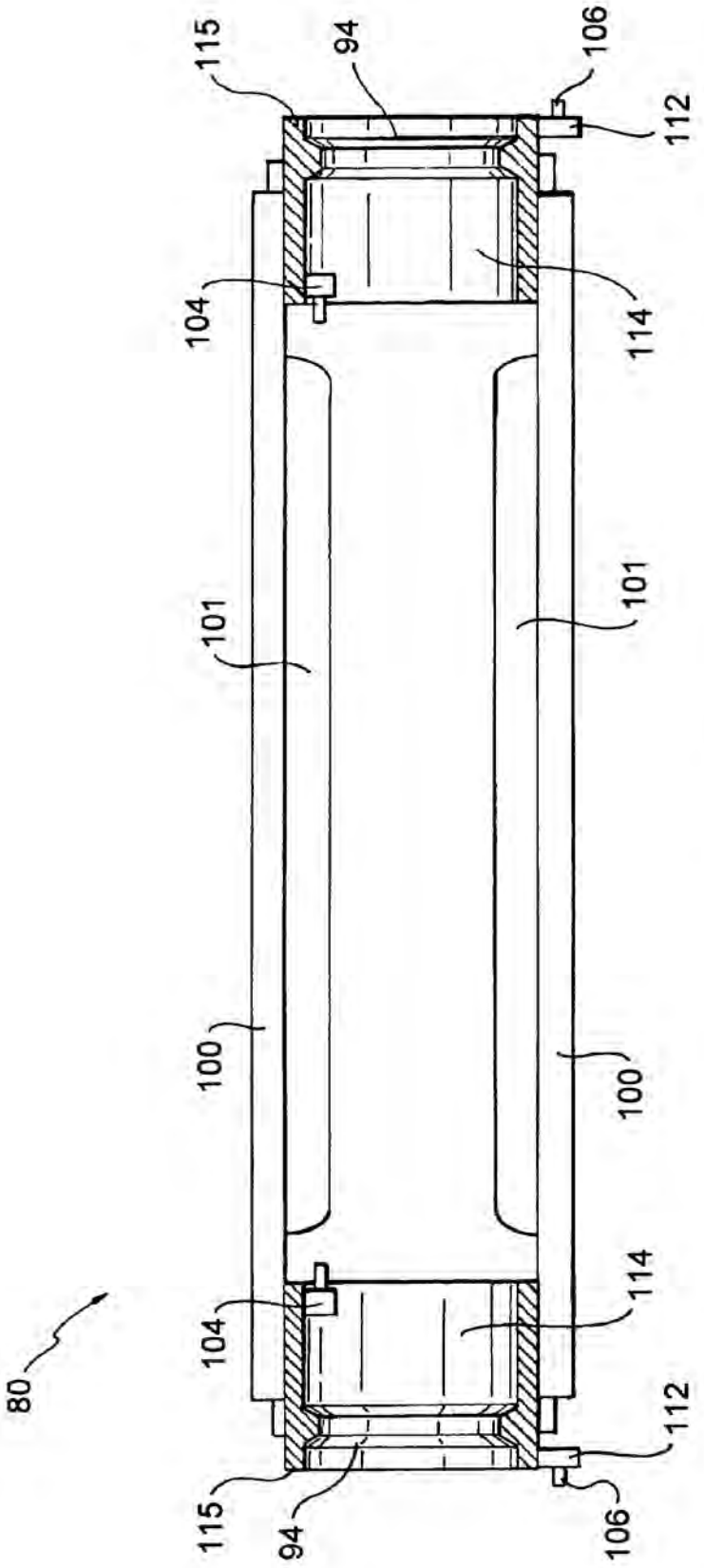


Fig. 7

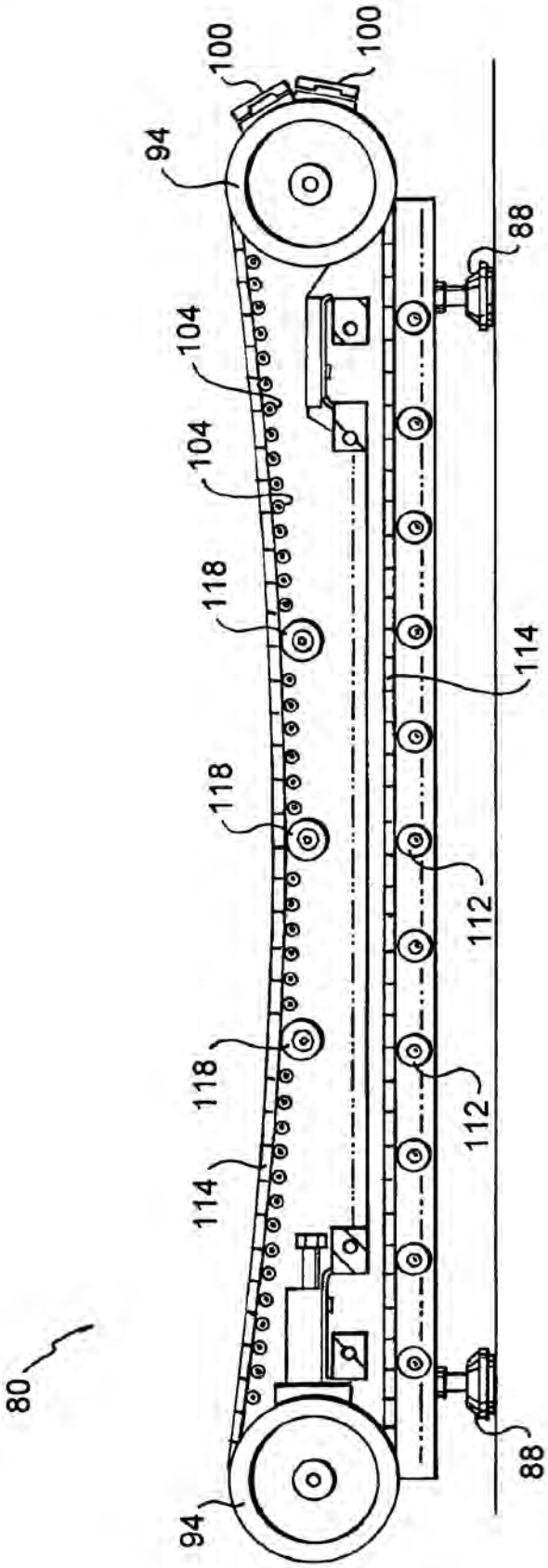


Fig. 8

LEG-POWERED TREADMILL

RELATED APPLICATIONS

This application claims benefit and priority in part under 35 U.S.C. 119(e) from provisional Application No. 61/280,265 filed Nov. 2, 2009, the entire disclosure of which is incorporated by reference herein. This application is a continuation-in-part of a regular examinable utility patent application filed on Oct. 29, 2010, Ser. No. 12/925,770, the entire disclosure of which is incorporated by reference herein. Applicant claims priority in part under 35 U.S.C. §120 therefrom.

FIELD OF THE INVENTION

The present invention relates to a motor-less leg-powered treadmill produced that allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards.

BACKGROUND OF THE INVENTION

Exercise treadmills allow people to walk, jog, run, and sprint on a stationary machine with an endless belt moving over a front and rear sets of pulleys.

OBJECTS OF THE INVENTION

It is an object of the present invention to provide a motor-less leg-powered curved treadmill produced that allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards.

It is also an object of the present invention to provide a closed loop curved treadmill belt in a concave shape supported by end rollers in a low friction manner in a substantial stationery frame.

It is also an object of the present invention to provide a curved treadmill that assumes a concave upper contour and a taut lower portion.

Other objects which become apparent from the following description of the present invention.

SUMMARY OF THE INVENTION

The present invention is a motor-less leg-powered curved treadmill produced wherein the curved, low friction surface allows people to walk, jog, run, and sprint without making any adjustments to the treadmill other than shifting the user's center of gravity forward and backwards. This novel speed control due to the curve allows people of any weight and size to adjust their own speed in fractions of a second. The user controls the speed by positioning their body along the curved running surface. Stepping forward initiates movement, as the user propels themselves up the curve the speed increases. To slow down, the user simply drifts back towards the rear curve. For running athletes, no handrails are needed. Handrails are optional for non-athletes with balance or stability limitations. The motor-less leg-powered treadmill permits low foot impact on the running surface through it's new design, forcing the user to run correctly on the ball of the feet and therefore reducing pressure ands strain of the leg joints. This unique design of the curve in a low friction surface allows any user, regardless of weight and size, to find and maintain the speed they desire. The user steps on the concave curved treadmill belt section and begins walking, steps up further and begins running, steps up even farther and starts to sprint. When stepping backward the motor-less leg-powered treadmill will stop.

Utilizing a closed loop treadmill belt supported by end rollers in a low friction manner in a substantial stationery frame, the curved treadmill of this invention makes it possible for the user to experience a free running session, with the potential to have the real feeling of running, and the ability to stop and sprint and walk instantly, thereby simulating running outside on a running track. This novel speed control in running was not possible in the prior art because of the lack of curved low friction running surfaces.

The closed loop treadmill belt must be of such a length as compared to the distance between the end rollers to permit it to assume the required concave upper contour. To keep it in that configuration in all operational modes, a method of slackening the curved upper portion while simultaneously keeping the lower portion taut (i.e.—preventing it from drooping down) is used. This method must not add significant friction to the treadmill belt since this would detract from the running experience of the user.

Several methods of controlling the treadmill belt configuration in a low friction manner are described. One method is to use a support belt under the treadmill belt lower portion. This support belt is kept in a taut configuration with a horizontal section by using springs pulling pulleys in opposite directions.

Another method uses a timing belt linking the treadmill belt end rollers such that after the desired configuration is achieved, the treadmill belt and end rollers must move synchronously thereby denying the treadmill belt the opportunity to have its lower section droop down.

Yet another method is to support the lower section of the treadmill belt from drooping down by directly supporting this section with one or more linear arrays of low friction bearings at the peripheral edges of the belt below the lower section.

In another embodiment of this invention, the treadmill belt is constructed of two loops of v-belt with a custom crossection attached with fasteners near each end of each transverse slat. Thus the adjacent slats cover the entire user surface on the outside of the v-belt loops. The slats themselves can be fabricated from wood, wood products, plastic, or even rubber. The v-belt custom crossection provides flat extensions on either side of the v-section for support of the treadmill belt away from the large v-belt pulleys at the front and back of the treadmill. By supporting on a resilient continuous belt surface instead of the slats themselves, smoothness of operation is insured.

The v-belt construction provides excellent lateral centering of the treadmill belt in the chassis. Ball bearing support rollers in a linear array at each side bearing on the outer flat v-belt extensions support the bottom portion of the belt to keep it from drooping. A concave array of ball bearings at each side of the chassis supports the treadmill belt by bearing on the inner v-belt extensions to support the top user-contact section. The weight of the treadmill belt itself helps it conform to this support contour.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can best be understood in connection with the accompanying drawings. It is noted that the invention is not limited to the precise embodiments shown in drawings, in which:

FIG. **1** is a perspective view of the exterior of one embodiment of the present invention; showing the runner in a slow walk in the droop of the concave upper portion of the treadmill ball.

FIG. **1**A is a perspective view of the exterior of the embodiment in FIG. **1**, showing the runner running at a fast pace uphill.

FIG. **1**B is a perspective view of the exterior of the embodiment in FIG. **1**, showing the runner running slowly in the droop of the concave portion.

FIG. **2** is a diagrammatic side view of the system components for the embodiment of FIG. **1** for implementing the present invention.

FIG. **3** is a diagrammatic side view of the system components for a second embodiment for implementing the present invention.

FIG. **4** is a diagrammatic side view of the system components for a third embodiment for implementing the present invention.

FIG. **5** is a perspective view of the third embodiment shown in FIG. **4**, having a v-belt and a lower linear array of ball bearings in the curved treadmill, and showing an optional removable handlebar assembly.

FIG. **6** is a perspective view of the curved treadmill embodiment of FIG. **5** having a v-belt and a lower linear array of ball bearings, with the side covers and treadmill belt removed to reveal the various operating parts.

FIG. **7** is an end view of the curved treadmill embodiment of FIG. **5** having a v-belt and a lower linear array of ball bearings, illustrating the support of a top slat and a bottom slat using the side extension features of the custom v-belt.

FIG. **8** is a side elevation of the v-belt treadmill chassis of the embodiment of FIG. **5** with a v-belt and a lower linear array of ball bearings, showing the supported path of the v-belt; wherein the vertical side of the outer frame member is rendered invisible for clarity of detail.

DETAILED DESCRIPTION OF THE DRAWINGS

The description of the invention which follows, together with the accompanying drawing should not be construed as limiting the invention to the example shown and described, because those skilled in the art to which this invention appertains will be able to devise other forms thereof.

FIG. **1** is a perspective view of a leg-powered treadmill **10** constructed and having an operating mode according to the present invention.

As noted in FIG. **1**, no hand rails are shown. The curved treadmill **10** can be used without hand rails. Hand rails can be optionally provided for non-athletes with balance or running stabilities limitations.

Illustrated are two leg supports **10** and **12** which lift the treadmill **14** in a clearance position above a support surface **16**, said treadmill **10** having space apart sides **18** and **20** which have journalled for rotation end rollers **22** and **24** which support a closed loop treadmill belt **26**. Low friction methods to be described are used to hold taut the length of the lower belt portion **26**A in a dimension of approximately forty-three inches denoted by dimension line **30**. The upper belt portion **26**B weighs approximately forty pounds is also denoted by the dimension line **30**.

It is to be noted that an essential feature of treadmill **10** is a concave shape subtending an acute angle **34** in the treadmill **10** front end **14**A which in practice results in the exerciser **36** running uphill and concomitantly exerting body weight **38** that contributes to driving lengthwise **40** in the direction **42** in which the exerciser runs and achieves the benefits of the exercise. As the runner **36** encounters the different positions on the treadmill belt **26** of the treadmill **14**, the angle of the surface of running changes For example, as shown in FIG. **1**, when the center of gravity of body weight, indicated by downward directional arrow **38**, below the hips of the user **36**, is in the lower dropping portion of the concave upper portion **26**B of the treadmill belt **26**, the runner **36** walks or slowly jogs in a generally horizontal orientation, as indicated by directional arrow **42** in a first slow jogging speed. But, as shown in FIG. **1**A, as the runner **36** speeds up and advances the runner's hips and center of gravity of body weight further forward up the angled slope at the front end **14**A of the treadmill belt **26**, the angle of movement **42** changes from a generally horizontal angle **42** in FIG. **1** to an acute angle **42** up off the horizontal as in FIG. **1**A, which concurrently causes the runner **36** to run vigorously faster, at the acute angle **42** up the slope of the front **14**A of the concave curve of upper belt portion **26**B of treadmill belt **26**, the runner **36** runs faster uphill. Furthermore, as shown in FIG. **1**B, it does not matter where the runner **36** puts the forward foot to change the speed. In FIG. **1**B the center of gravity in the hip region of the runner **36**'s body weight, indicated by downward directional arrow **38**, is still in the lower part of the concave droop of the upper portion **26**A of treadmill belt **26**. So even though the runner **36** in FIG. **1**B is jogging faster than walking or slowly jogging as in FIG. **1**, so long as the runner **36** has the forward foot partially up the angled slope of the forward portion **14**A of the upper belt portion **26**B, the runner will still run slower in FIG. **1**B, not because the forward foot is up the slope of upper belt portion **26**B of the treadmill belt **26**, but because the center of gravity of body weight, as indicated by downward directional arrow **38**, is still within the lower confines of the droop of the concave upper belt portion **26**B. Therefore, what changes the speed of the runner **36** and the treadmill belt **26**, is when the runner **36** moves the center of gravity of the hips of the body weight indicated by downward directional arrow **38** higher up the slope of concave upper portion **26**B of treadmill belt **26**, which causes the runner to run faster and the belt **26** to concurrently move faster around pulleys **22** and **24** with the pace of the forward advancing runner **36**.

It is known from common experience that in prior art treadmills, the upper length portion of their closed loops are flat due, it is believed, because of the inability to maintain the concave shape **34** in the length portion **26**B. This shortcoming is overcome by the weight **30** which in practice has been found to hold the concave shape **34** during the uphill running of the exerciser **36**.

A closed loop treadmill belt **26** is formed with a running surface of transverse wooden, plastic or rubber slats **49** (see FIG. **1**) attached to each other in a resilient fashion. Since an essential feature of treadmill **10** is the concave shape of the low friction running surface of belt **26** in upper portion **26**B, methods are used to insure that this shape is maintained during actual use. These methods must prevent the lower portion **26**A of treadmill belt **26** from drooping down (i.e.—must be held taut), otherwise top portion **26**B would be pulled taut into a flat shape between rollers **22** and **24**. Three methods are illustrated by the side view schematic drawings of FIGS. **2**-**4**.

The method of FIG. **2** shows a flat support belt loop **50** engaged with two side pulleys **54** and a third pulley **56** which is attached to treadmill **10** frame. Two springs **52** pulling in opposite directions hold belt **50** taut with a flat top configuration in contact with bottom treadmill belt portion **26**A. Since pulleys **54** and **52** are low friction, and there is no relative movement between belt **50** and belt **26**, belt **50**

imposes very little drag on belt **26** while supporting lower belt portion **26**A vertically preventing it from drooping down.

The method shown in FIG. **3** shows the use of a timing belt **67** in achieving a similar result. Here end rollers **60** and **64** are attached to timing belt pulleys **62** and **66** respectively. Timing belt idlers **68** are simply used to configure timing belt geometrically to fit within the constraints of the side contours of treadmill **10**. If belt **26** is prevented from slipping relative to end rollers **60** and **64** by high friction coefficient (or by the use an integral timing belt on the inside of belt **26** and rollers with timing belt engagement grooves), once configured as shown, timing belt **67** will not permit drooping down of section **26**A since all motion is now synchronous.

In another method shown in FIG. **4**, one or more linear arrays of bearings **70** extending along opposite peripheral edges of said treadmill frame physically support lower section **26**A of treadmill belt **26** thereby preventing drooping. Bearings **70** may be ball bearings or straight ball bearing casters attached and located at respective side peripheral edges to the bottom surface of the frame of treadmill **10**.

In the v-belt treadmill embodiment **80** of FIG. **5**, side covers **82** enclose the underlying chassis. Running surface **81** comprises a concave surface of transverse slats. Optional handle bar assembly **83** helps users who are balance-challenged to use treadmill **80**; it is both optional and removable.

FIG. **6** shows the chassis of the treadmill of FIG. **5**. Robust cross beams **90** attach both outer frames **86** as well as inner frames **92** on each side to each other creating the roughly rectangular chassis. Bolts **108** attach the outer frames **86** to cross beams **90**. A few slats **100** are shown; they each have one or more downwardly extending reinforcing fins **101** attached on the inner side. Regardless of the material selected for the slats, they must exhibit the desired resiliency and strength along with sufficient weight to lie on and conform to the concave row of upper support ball bearings **104** at each side. The peripheral bearings are spaced apart from each other on respective left and right sides of the curved treadmill **80**, wherein the fins **101** of the transverse slats **100** extend cantilevered downward from each transverse slat **100** so that the transverse slats **100** are resilient to dip slightly under the weight of the user runner without any lower support directly below the transverse slats **100**.

The construction of the treadmill belt and its path around the chassis contour will be illustrated in FIGS. **7** and **8**. The v-belt (not shown in this FIG. **6**) rides in v-belt pulleys **94** at front and back. Since the treadmill belt formed from two v-belt loops with transverse slats **100** attached is itself a large heavy loop, adjusters **96** on the rear (and/or front) pulleys **94** are used during initial installation and to fine tune the distance between the front and back pulleys **94** for precise smooth operation that is not so tight as to bind, nor too loose as to be noisy. Bolts **106** (on both sides) attach a linear array of ball bearings **112** to support the bottom of treadmill belt **81** to prevent drooping. Level adjusters **88** are used to adjust the tilt of treadmill **80**.

FIG. **7** shows the two v-belts **114** in an inner end view near front end pulleys **94**. The two v-belt crossections **115** are plainly illustrated showing the short outer extension and the longer inner extension on each side of the "v". Top slat **100** with fin **101** facing downward is shown at the top. In this view, at each crossection **115**, two bolt heads are clearly shown; they fasten the longer inner flat belt extension to the end of slat **100**. At each side the belt "v" is clearly positioned within the top groove of pulley **94** with ball bearing **104** supporting the edge of treadmill belt **81** through the resilient smooth continuous inner extension of belt **114**. Similarly, at the bottom slat **100** fin **101** is now positioned facing up into the vacant midsection. Larger ball bearings **112** supporting the bottom belt **81** section are seen impinging on short outer v-belt **114** extensions at each side.

FIG. **8** is a side view of the chassis with outer vertical side **110** of outer frame **86** rendered invisible to reveal the relative position of the other components in the v-belt support pathway. Only two slats **100** are shown attached to v-belt **114** (on the right pulley **94**) for clarity. Note the taut, non-sagging position of the bottom section of belt **114** as supported by array of ball bearings **112**. On top, the drooping concave belt **114** is supported by the concave array of ball bearings **104**. The three centrally located v-belt idler pulleys **118** keep belt **114** from moving laterally far from large end v-belt pulleys **94**. The weight of treadmill belt **81** keeps it in contact with the concave contour of ball bearings **104** at any speed from stopped to full running.

In the foregoing description, certain terms and visual depictions are used to illustrate the preferred embodiment. However, no unnecessary limitations are to be construed by the terms used or illustrations depicted, beyond what is shown in the prior art, since the terms and illustrations are exemplary only, and are not meant to limit the scope of the present invention.

It is further known that other modifications may be made to the present invention, without departing the scope of the invention, as noted in the appended Claims.

I claim:

1. A motor-less, leg-powered curved treadmill comprising:

a treadmill frame;

a set of respective front and rear pulley end rollers for rotation, said front and rear pulleys supporting a closed loop treadmill belt;

said closed loop treadmill belt comprising a plurality of parallel slats oriented perpendicular to an axis of rotation of said belt, said parallel slats attached to each other in a resilient fashion;

said closed loop treadmill belt being of such a length as compared to the distance between the end rollers to permit it to assume a required concave upper contour;

a means for slackening an upper concave portion while simultaneously keeping a lower portion of the belt taut, preventing said lower portion from drooping down during rotation and exertion of walking or running force upon said upper concave portion of said closed loop treadmill belt;

wherein each said slat is made of a material with sufficient resiliency and strength and weight to lie on and conform to a concave row of upper support peripheral ball bearings located at each peripheral side of said upper portion of said motor-less, leg-powered curved treadmill.

2. The motor-less, leg-powered curved treadmill as in claim **1** wherein respective side covers enclose an underlying chassis.

3. The motor-less, leg-powered curved treadmill as in claim **2** wherein said chassis includes at least one robust cross beam attaching respective outer frames and respective inner frames on each side to each other, thereby providing a rectangular chassis.

4. The motor-less, leg-powered curved treadmill as in claim **1** wherein said motor-less, leg-powered curved treadmill is provided without a handle bar assembly.

5. The motor-less, leg-powered curved treadmill as in claim **1** wherein said motor-less, leg-powered curved treadmill is provided with a removable handle bar assembly, which when installed on said motor-less, leg-powered curved tread-

mill, said handle bar assembly help users who are balance-challenged to use said motor-less, leg-powered curved treadmill.

6. The motor-less, leg-powered curved treadmill as in claim **1** wherein each said slat includes at least one fin descending downward from each said slat.

7. The motor-less, leg-powered curved treadmill as in claim **6** wherein each said slat includes a plurality of fins descending downward from each said transverse slat.

8. The motor-less, leg-powered curved treadmill as in claim **6** wherein each said rows of peripheral bearings are spaced apart from each other on respective left and right sides of said curved treadmill, wherein further said fins of said slats extend cantilevered downward into a vacant mid-section of said treadmill from each said slat so that said slats are resilient to dip slightly under the weight of a user runner without any lower support below non-peripheral mid-sections of said slats.

9. The motor-less, leg-powered curved treadmill as in claim **1** wherein said transverse slats are made of a material selected from the group consisting of rubber, plastic and wood.

10. The motor-less, leg-powered curved treadmill as in claim **1** wherein respective adjusters are provided on at least one set of said pulleys to adjust the distance separating said pairs of front and rear pulleys to insure precise smooth movement of said belt over said pairs of front and rear pulleys.

11. The motor-less, leg-powered curved treadmill as in claim **1** further comprising level adjusters extending down from said frame to adjust the tilt of said motor-less, leg-powered curved treadmill.

12. The motor-less, leg-powered curved treadmill as in claim **1** wherein said means for slackening the upper portion while simultaneously keeping the lower portion taut, preventing said lower portion from drooping down during rotation and exertion of walking or running force upon said upper concave portion of said closed loop treadmill belt comprises at least a pair of linear arrays of bearings extending along and located at opposite peripheral edges of said treadmill frame, each said array of peripheral edge bearings physically supporting said lower portion of said closed loop treadmill belt in a taut non-drooping configuration.

13. The motor-less, leg-powered curved treadmill as in claim **12** wherein said linear array of lower peripheral bearings supporting said lower taut portion of said curved treadmill belt are each attached to respective right and left side frame members of said chassis to prevent drooping of said lower portion of said curved treadmill belt.

14. The motor-less, leg-powered curved treadmill as in claim **1** wherein said closed loop treadmill belt having an extension wing including a v-belt portion,

said slats of said closed loop treadmill belt joined to said closed loop treadmill belt having said v-belt portion, said v-belt portion insertable and riding within a corresponding v-shaped groove within each of said front and rear pulleys.

15. The motor-less, leg-powered curved treadmill as in claim **14** wherein each said v-belt portion of said curved treadmill belt includes a short outer extension and a longer inner extension on each side of a v-shaped portion of said v-belt portion, wherein further one or more bolts fasten said longer inner flat belt extension to a respective end of each said slat, wherein said v-shaped portion of said v-belt portion is positioned within said respective v-shaped groove of each said pulley, wherein further a respective ball bearing of said concave peripheral row of ball bearings support a respective edge of said curved treadmill belt.

16. The motor-less, leg powered curved treadmill as in claim **15** further comprising a plurality of centrally located v-belt idler pulleys keeping said extensions of said curved treadmill belt from moving laterally from said pulleys.

17. The motor-less, leg-powered curved treadmill as in claim **16** wherein the respective weight of said curved treadmill belt keeps respective peripheral edges of said treadmill belt in contact with the respective concave contours of said peripheral ball bearings at any speed from stopped to full running speed.

* * * * *

Leg-Powered Treadmill

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Case Name:	Speedfit LLC and Aurel Astilean, v. Woodway USA
Beacon Project No.:	10034
Report Date:	August 26, 2015
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ASSIGNMENT

On July 27, 2015, Beacon Forensic, P.C. (BFPC) issued a report concerning a leg-powered treadmill and its patents. The plaintiff, Mr. Aurel Astilean, invented a leg-powered treadmill and filed a provisional patent application and subsequently secured two issued patents. It was reported that the defendant, Woodway USA (Woodway) and Mr. Douglas Bayerlein its President and CEO, stated that the leg-powered treadmill as disclosed in the provisional patent application does not enable one to make the invention as claimed in the issued patents.

Additional file material was reviewed, including a report issued by Kim Blair, Ph.D., titled "Expert Report of Kim B Blair, Ph.D.". After a review of the additional file material, a report was requested to address issues raised in the report of Dr. Blair.

In response to this request, BFPC completed additional work including the following:

- Reviewed file material:
  - Expert Report of Kim B Blair, Ph.D.
  - Provisional Patent Application No. 61/161,027
  - Letter from Mr. John Vodopia to Woodway's Counsel, dated May 22, 2015
  - Email from Mr .Astilean dated October 6, 2008 (PLTFESI001689,90,92-94)
  - Emails from Mr. Nick Oblamski, a Senior Project Engineer with Woodway, to Mr. Astilean dated January 26, 2009 (PLTFESI001821) and February 28, 2009 (PLTFESI002205)
  - Email from Mr. Oblamski to Mr. Doug Bayerlein, a representative of Woodway, dated January 12, 2009 (WOODWAY0032022-24)
  - Email from Mr. Oblamski to Messrs. Eric Weber, Scott Hoerig, Mr. Vance Emons and Bayerlin, representatives of Woodway, dated December 17, 2008 (WOODWAY0032138-39)
  - Email from Mr. Oblamski to Mr. Mark LaFond, representatives of Weimer Bearing, dated February 3, 2009 (WOODWAY0046280-82)
  - Email from Mr. Oblamski to Mr. Todd Mooig, representatives of Brecoflex, dated January 12, 2009 (WOODWAY0051725)
  - Purchase order 2009227 from McMaster-Carr (WOODWAY0051631)
  - Video of the leg-powered treadmill on the Discovery Channel (PLTFESI012011)
  - Videos of the leg-powered treadmill from December 2008 (PLTFESI013758-59)
- BFPC researched pertinent sections of the Manual Of Patent Examining Procedure

EMAIL FROM MR. ASTILEAN DATED OCTOBER 6, 2008

On October 6, 2008, Mr. Astilean sent an email which contained five photographs of a wooden prototype of the leg-powered treadmill. The photographs were reportedly captured in Montreal, Canada around August 2008, in the backyard of Mr. Don Bostan, reportedly the co-inventor of the leg-powered treadmill. Two of the photographs were oblique views of the wooden prototype treadmill (**Figures 1 and 2**)**.** One of the photographs contained a view of the bottom of the treadmill (**Figure 3)**. The bottom of the treadmill had a belt and pulley system, used to keep the top portion of the belt slackened while the bottom portion was taught.

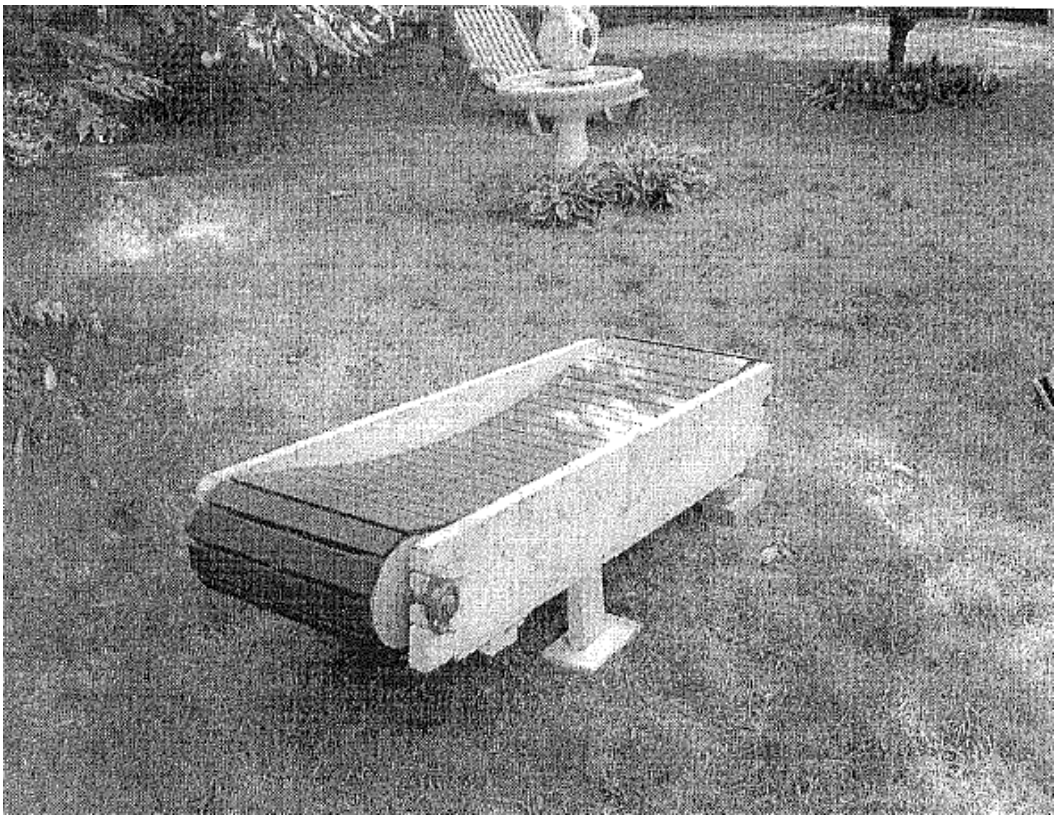

Figure 1: An oblique view of a wooden prototype of the treadmill.

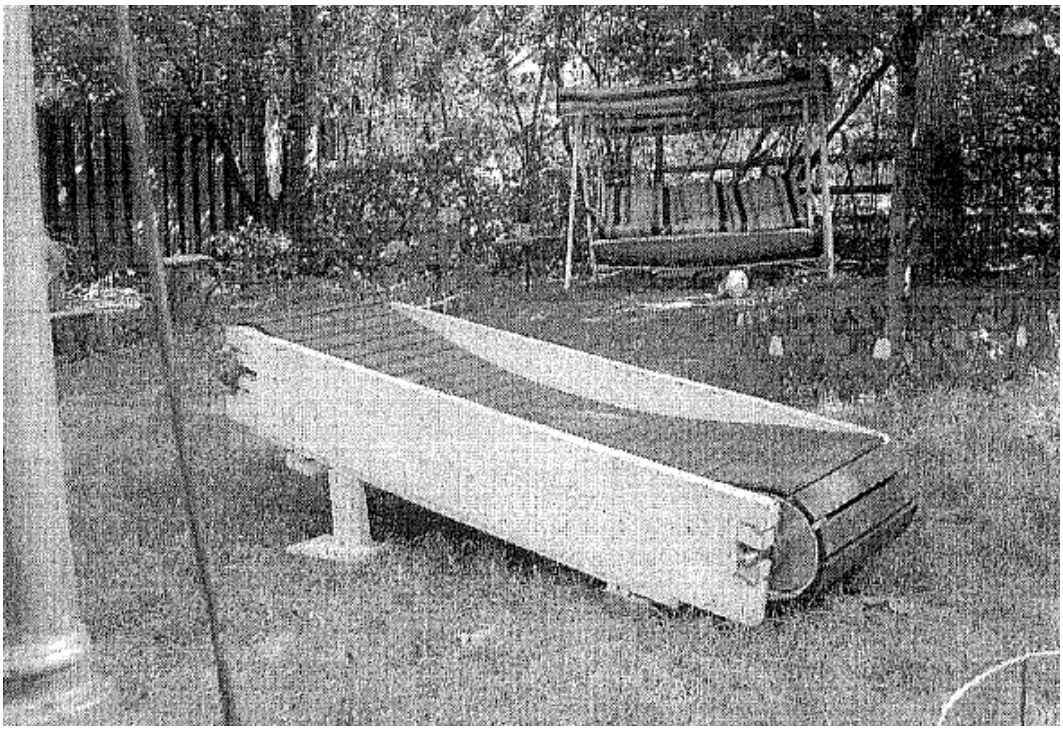

Figure 2: An oblique view of a wooden prototype of the treadmill.

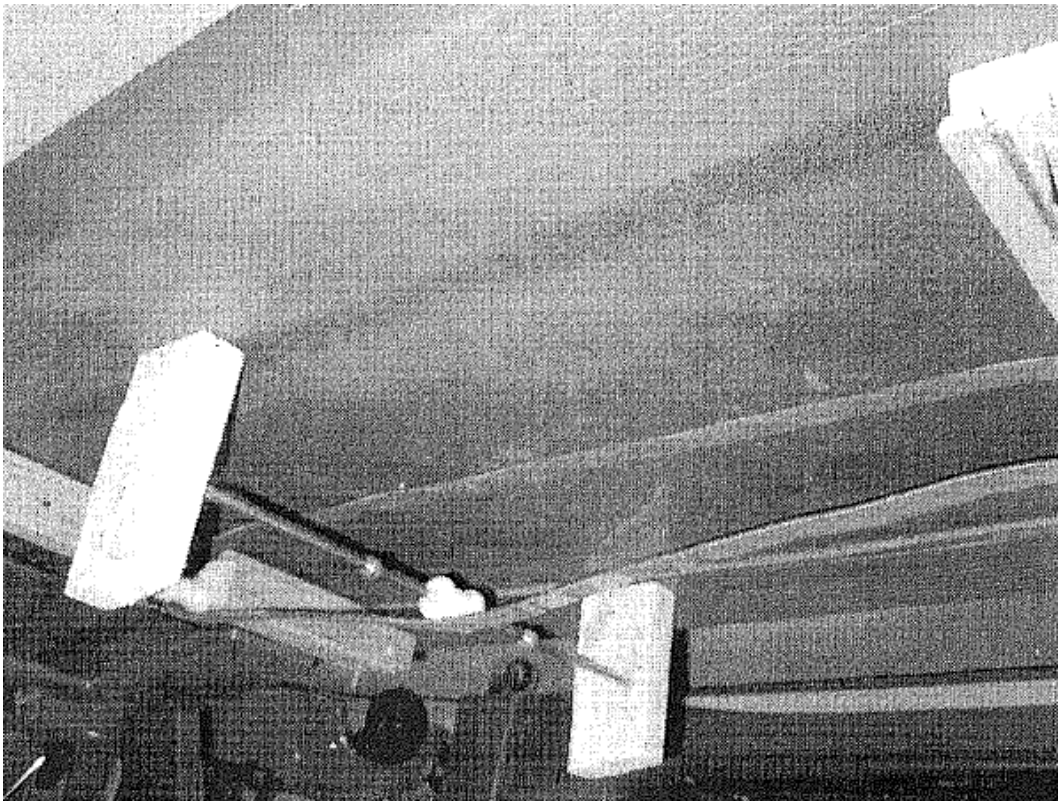

Figure 3: A bottom view of the wooden prototype of the treadmill. A belt and pulley was in place to keep the top portion of the belt slackened while the bottom portion was taught.

VIDEO FROM MR. ASTILEAN CAPTURED IN AUGUST, 2008

Mr. Astilean created two videos of the wooden prototype leg-powered treadmill in operation. The videos were reportedly created in August of 2008 for testing purposes at the home of reported co-inventor Mr. Bostan in Montreal, Canada. In one video, the treadmill was concealed and there were multiple operators walking and jogging on what presumably was the leg-powered treadmill. In the second video, the leg-powered treadmill was visible and was operated by people of various ages, heights and weights at speeds between walking and running. The leg-powered treadmill was in full view. Two stills from the video were included in this report. In one still, a child was seen running on the treadmill (**Figure 4**). In another still, an adult was seen walking on the treadmill (**Figure 5**).

Reportedly, the videos were shown to Mr. Bayerlein and Mr. Scott Weber at the Woodway offices in Milwaukee, Wisconsin in December, 2008. It was also reported that Mr. Bayerlien stated in his deposition on April 24, 2015 that Mr. Astilean had explained a means for slackening to Mr. Bayerlien after showing the subject video.

Figure 4: Video reportedly created in August of 2008, a child was seen running on the wooden prototype leg-powered treadmill.

Figure 5: Video reportedly created in August of 2008, an adult was seen walking on the wooden prototype leg-powered treadmill.

VIDEO FROM WRECKREATION NATION RELEASED FEBRUARY 24, 2009

Mr. Astilean participated in a television show which contained a segment showing his various inventions, including the leg-powered treadmill. The leg-powered treadmill (**Figure 6**) was seen being operated by Mr. Astilean and a child. They were both walking and running on the treadmill. The leg-powered treadmill in the videos was configured by Mr. Astilean from the wooden prototype depicted in the videos shown to Mr. Bayerlein and Mr. Weber in December 2008.

Figure 6: Video from Wreckreation Nation dated February 24, 2009, an adult and child were using the leg-powered treadmill.

PROVISIONAL PATENT APPLICATION NO. 61/161,027

The following was noted from the Provisional Patent Application:

Application Number:	61/161,027
Filing Date:	March 17, 2009
Inventor:	Mr. Nicholas Oblamski

The written description included the following:

[0002] Some embodiments of the invention provide an energy-efficient and self-regulating curved treadmill. The curved treadmill can use a main pulley system and a secondary pulley system on either end

to control a main belt and a synchronous belt for a safe and comfortable curved running surface. Some embodiments of the curved treadmill do not require external power and the speed of the curved treadmill can be controlled by where a runner positions himself along the main belt.

[0008] FIG. 1 (**Figure 7**) illustrates a curved treadmill 10 according to one embodiment of the invention. The curved treadmill 10 can be a self-regulating, energy-efficient, and low-impact treadmill. The curved treadmill 10 can include a base 12, a main belt 14, a synchronous belt 16, a main pulley system 18, and a secondary pulley system 20

[0010] The curved treadmill 10 can also include front and rear shafts 26 and 28, respectively, on either end. Bearing rails 30 between the shafts 26, 28 can support the main belt 14. The main belt 14 can be wrapped around the base 12 and be in contact with the main pulley system 18 at either end of the base 12, as shown in FIG. 2. The synchronous belt 16 can also wrap around the base 12 along one or both sides of the main belt 14, and be in contact with the secondary pulley system 20 at either end of the base 12. The synchronous belt 16 can be controlled by the secondary pulley system 20 and the main belt 14 can be controlled by both the main pulley system 18 and the secondary pulley system 20. The secondary pulley system 20 can be coupled to the main pulley system 18 at one or both ends.

[0011] In some embodiments, as shown in FIGS. 1 and 2, the pulley systems 18, 20 can be coupled to the front and rear shafts 26, 28 and the main belt 14 and the synchronous belt 16 can be in contact with the main pulley system 18 and the secondary pulley system 20, respectively, only at each end of the base 12. Thus, as shown in FIG. 3, there can be minimal components in contact with the main belt 14 or the synchronous belt 16 near the center 22 of the base 12. In such embodiments, the weight of the main belt 14 and the synchronization of the pulley systems 18, 20, can allow the main belt 14 to follow a top curve of the curved treadmill 10 rather than "float" straight across the top of the curved treadmill 10.

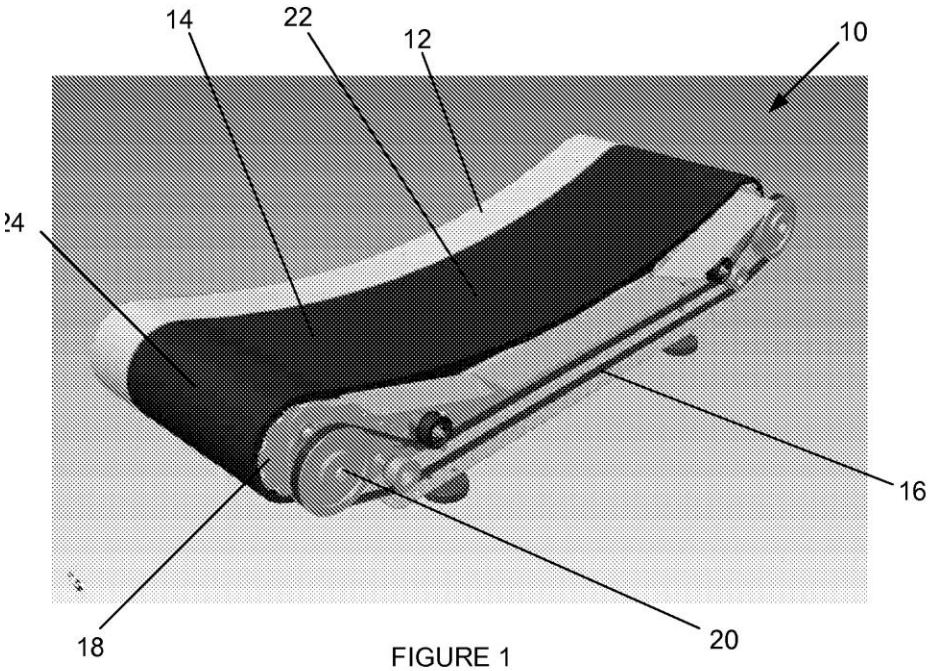

FIGURE 1

Figure 7: A drawing from the Provisional Patent Application 027.

MANUAL OF PATENT EXAMINING PROCEDURE (MPEP)

The MPEP is a manual published to provide U.S. Patent and Trademark Office (USPTO) patent examiners, applicants, attorneys, agents, and representatives of applicants with a reference work on the practices and procedures relative to the prosecution of patent applications before the USPTO. It contains instructions and material in the nature of information and interpretation in the normal examination of a patent application.

According to MPEP section 2132 titled, "Pre-AIA 35 U.S.C. 102(a)":

> A person shall be entitled to a patent unless –(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

According to the MPEP section 2133 titled, "Pre-AIA 35 U.S.C. 102(b)":

> A person shall be entitled to a patent unless -(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

According to the MPEP section 2137 titled, "Pre-AIA 35 U.S.C. 102(f)":

> A person shall be entitled to a patent unless -(f) he did not himself invent the subject matter sought to be patented.

According to MPEP section 2181 titled, "Identifying and Interpreting a 35 U.S.C. 112(f) or Pre-AIA 35 U.S.C. 112, Sixth Paragraph Limitation":

> This section sets forth guidelines for the examination of 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, "means or step plus function" limitations in a claim. These guidelines are based on the Office's current understanding of the law and are believed to be fully consistent with binding precedent of the Supreme Court, the Federal Circuit and the Federal Circuit's predecessor courts. These guidelines do not constitute substantive rulemaking and hence do not have the force and effect of law.
>
> The Court of Appeals for the Federal Circuit, in its en banc decision In reDonaldson Co., 16 F.3d 1189, 1194, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994), held that a "means-or-step-plus-function" limitation should be interpreted as follows:
>
> Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. **Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination.**
>
> Therefore, the broadest reasonable interpretation of a claim limitation that invokes 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, is the structure, material or act described in the specification as performing the entire claimed function and equivalents to the disclosed structure, material or act.

The above paragraphs references 35 U.S.C. 112 (f), which is repeated below:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

DISCUSSION

BFPC reviewed the report of Dr. Blair. Dr. Blair had multiple conclusions, starting on page 1 paragraph 2 of his report, including the following:

> a) It is my opinion that the 2009 provisional patent application to which the Astilean patents purport to claim priority, U.S. Provisional Patent Application No. 61/280,265 ("the '265 Provisional Application"), does not adequately support the November 2, 2009 priority date for the claims of the Astilean patents. At a minimum, the '265 Provisional Application fails to teach, suggest, or disclose any alleged invention of the following elements from claim 1 of the '619 patent:
>
> > "a timing belt having respective timing belt pulleys attached to said front and rear pulley rollers for said closed loop treadmill belt";
> > "wherein timing belt idlers are used to configure said timing belt geometrically to fit within constraints of side contours of said treadmill"; and
> > said timing belt will not permit drooping down of said lower taut portion of said closed loop treadmill belt because all respective motion is synchronous"
>
> (emphasis added). Accordingly, these elements can only be given the filing date of the '619 patent, which is October 29, 2010 (i.e., the effective filing date of the '619 patent). Regarding the '016 patent, the '265 Provisional Application and the '619 patent fail to teach, suggest, or disclose the corresponding structure for the claimed "means for slackening," which as Plaintiffs claim, is a "synchronizing system for the running belt that keeps the upper portion from floating up (Figs. 2-4)."1 This concept is first disclosed in the specification for the '619 patent (and also appears in the '016 patent), not the '265 Provisional Application. More specifically and relevant for this Report, the '265 Provisional Application fails to teach, suggest, or disclose the inclusion of a synchronizing system, including a timing belt, in a manual, curved treadmill as depicted in Figure 3 of the Astilean patents. Thus, the earliest filing date afforded to this subject matter is the '619 filing date, which is October 29, 2010.

The Astilean provisional patent application disclosed and Patents 619 and 016 claimed a motor-less leg-powered treadmill with means for slackening the upper belt portion of the treadmill belt in order to keep the upper belt position from floating up, by different methods for keeping the lower belt portion taut. All the documents disclosed or claimed a taut lower belt or maintained the upper belt portion in a slackened state. The provisional patent application disclosed that the weight of the belt in combination with springs was one way of solving the problem of maintaining the upper belt in a slackened state. Patents 619 and 016 claimed a treadmill with means for slackening, as outlined in the BFPC report issued on July 27, 2015.

The various means of keeping the lower belt portion taut and the upper belt portion concave, including the synchronizing system, as disclosed or claimed in Patents 619 and 016 were mechanical and performed similar as to the method disclosed in the provisional patent application, which disclosed means for maintaining the upper portion of the running belt in a slackened state. **The Astilean provisional patent application does support the subject claims in both Patents 619 and 016.** The filing date of the Astilean provisional patent was November 2, 2009.

b) The Astilean patents are invalid as anticipated under 35 U.S.C. § 102(a) in light of Woodway's U.S. Provisional Patent Application No. 61/161,027 ("Woodway '027 Application") which was filed on March 17, 2009, and discloses each and every claim limitation incorporating a "synchronous belt" and "synchronous belt system," into a manual curved treadmill.

According to the MPEP, a 102(a) rejection is appropriate when "the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent." The Woodway provisional patent application was not published and was not a patent. Mr. Astilean had a video documenting that a working prototype of the leg-powered treadmill existed prior to the filing of the Woodway provisional patent application**. The Woodway provisional patent application would not anticipate the Astilean patents.**

c) The Astilean patents are invalid as anticipated under 35 U.S.C. § 102(b) in light of the public disclosure and introduction of what is now known as the CURVE treadmill, which incorporated the synchronous belt and synchronous belt system, which includes a timing belt, timing belt pulleys, and timing belt idlers during the International Health, Racquet & Sportsclub Association ("IHRSA") tradeshow on March 17, 2009, which is more than one year before the filing dates of the '619 and '016 patents.

d) The Astilean patents are invalid as anticipated under 35 U.S.C. § 102(b) in light of Woodway's successful manufacture and documented sale of what is now known as the CURVE treadmill beginning at IHRSA and continuing up to and through October 29 and November 1, 2009, which is more than one year before the filing dates of the '619 and '016 patents.

According to the MPEP, a 102(b) rejection is appropriate when "the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States." The Astilean patents references the Astilean provisional patent application, which was filed on November 2, 2009. The filing date of the Astilean provisional patent application was less than one year after the IHRSA tradeshow. **The IHRSA tradeshow would not anticipate the Astilean patents.** The leg-powered treadmill was on sale on October 29, 2009, less than one year from the Astilean provisional patent application. **The sale of the Curve treadmill would not anticipate the Astilean patents.**

e) The Astilean patents are invalid under 35 U.S.C. § 102(f) as Woodway engineer, Mr. Nicholas Oblamski, is an inventor of certain of the subject matter of the Astilean patents. There is corroborated clear and convincing evidence that Mr. Oblamski conceived of and reduced to practice a synchronous belt and synchronous belt system, which includes a timing belt, without any contribution by either Mr. Aurel (Alex) Astilean or Mr. Dan Bostan. For at least this reason, Mr. Oblamski should be named as an

> inventor on the Astilean patents, and these patents should be corrected pursuant to 35 U.S.C. § 256.

According to the MPEP, a 102 (f) rejection is appropriate when "he did not himself invent the subject matter sought to be patented." The MPEP also stated that definition for inventorship can be simply stated: "The threshold question in determining inventorship is who conceived the invention. Unless a person contributes to the conception of the invention, he is not an inventor. … Insofar as defining an inventor is concerned, reduction to practice, per se, is irrelevant [except for simultaneous conception and reduction to practice, Fiers v. Revel, 984 F.2d 1164, 1168, 25 USPQ2d 1601, 1604-05 (Fed. Cir. 1993)]. One must contribute to the conception to be an inventor." In re Hardee, 223 USPQ 1122, 1123 (Comm'r Pat. 1984)."

The file material documented that Mr. Astilean conceived the invention and created a working prototype of the treadmill by August, 2008. The working prototype was using an alternative method for keeping the lower belt portion taut and the upper belt portion concave. The file material documented that Mr. Oblamski and Mr. Astilean collaborated in building the production leg-powered treadmill, as early as the beginning of 2009. At this time Mr. Astilean already had disclosed to Woodway in December 2008 the need for a means for slackening, as embodied in the wooden prototype. The file material documented that Mr. Oblamski worked with suppliers starting around December 2008 and early 2009. This was to realize a metal production version of the wooden prototype including making changes to the means for slackening in the wooden prototype so same means could be modified to work in the metal production model, Speedboard 2. The production model, Speedboard 2, utilized the synchronous belt system to keep the lower belt portion taut and the upper belt portion concave. **The file material does not suggest that Mr. Oblamski conceived or was developing a leg-powered treadmill with a lower belt portion taut and the upper belt portion concave prior to working with Mr. Astilean.** The file material suggests that Mr. Oblamski was neither the inventor or co-inventor of the leg-powered treadmill. **The Astilean patents are not invalid under 102(f).**

Dr. Blair stated the following concerning claim construction:

> C. "Means For Slackening"
>
> 48. In the May 22, 2015 letter, Plaintiffs construe "means for slackening" as follows: "Means for slackening is construed to mean structure that operates to ensure that the concave shape of the closed loop belt 26 of treadmill 14 is maintained during actual use, and its equivalents."
>
> 49. I disagree with this proposed construction. As noted by Plaintiffs, and agreed to in Woodway's July 12, 2015 responsive e-mail, in the context of the '016 patent, "means for slackening" is a means plus function claim. In this type of claim language, an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. As noted by Woodway, the function and corresponding structure are not provided in Plaintiffs' proposed construction. I agree with Woodway's proposed construction, which is repeated here:

> Function: slacken an upper concave portion of the running belt while simultaneously keeping a lower portion of the running belt taut, preventing said lower portion from drooping down during rotation and exertion of walking or running force upon said upper concave portion of said closed loop running belt;
>
> and
>
> Corresponding structures: support belt as described and disclosed in Figure 2, col. 2, ll. 24-28, col. 4, l. 61 – col. 5, l. 2; timing belt as described and disclosed in Figure 3, col. 2, ll. 29-33, col. 5, ll. 3-13; linear array of ball bearings as described and disclosed in Figure 4, col. 2, ll. 34-37, col. 5, ll. 14-20.

According to the MPEP, "an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." **It would not be appropriate to limit the claims to the "corresponding structures" as stated by Dr.Blair. The claims should be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.**

Dr. Blair stated the following concerning the support in the Astilean provisional patent

> 90. As there is absolutely no mention of the timing belt or synchronous belt concepts (or their related components) in the '265 Provisional Application, nor were any figures similar to Figure 3 shown in the '619 or '016 patents included in the '265 Provisional Application, then the method of using a timing belt or synchronous belt system to keep the treadmill belt in contact with the concave surface is not communicated to a person of ordinary skill in the art. Thus, the priority date for the claimed invention of the timing belt and synchronous belt system is that of the '619 patent application. Indeed, Mr. Astilean agrees in that he stated during his deposition that the timing belt and synchronous belt system concepts were not disclosed in the '265 Provisional Application.17
>
> 91. In summary, the only concepts (under contention) in the '619 and '016 patents not described in the prior art are the use of a timing belt or synchronous belt system as a method to keep the treadmill belt in contact with the concave running surface. The earliest priority date these concepts are entitled to is the filing date of the '619 patent application, which is October 29, 2010. There is no support for the method of using a timing belt or synchronous belt system to keep the treadmill belt in contact with the concave running surface on a manual treadmill in the '265 Provisional Application. Said another way, there is no support for Figure 3 in the '265 Provisional Application.

As already stated, the Astilean provisional patent application disclosed and Patents 619 and 016 claimed a motor-less leg-powered treadmill with means for slackening the upper belt portion of the treadmill belt in order to keep the upper belt portion from floating up, by keeping the lower belt portion taut. The documents disclosed or claimed a taut lower belt or maintained the upper belt portion in a slackened state for maintaining the upper belt portion in a slackened, and, therefore, concave shape. The provisional patent application disclosed the weight of the treadmill belt in combination with springs. Patents 619 and 016 claimed multiple methods outlined in the BFPC report issued on July 27, 2015.

The methods of keeping the lower belt portion taut and the upper belt portion concave, comprising means for slackening as disclosed or claimed in Patents 619 and 016 were mechanical and performed similar as to the method disclosed in the provisional patent application, which disclosed means for maintaining the upper portion of the running belt in a slackened state. The Astilean provisional patent application does support the subject claims in both Patents; they all solve the same problem.

Dr. Blair stated the following concerning the invention conception:

> 94. As illustrated by the documents produced in this case as well as the deposition testimony that I have reviewed, in December of 2008, Woodway launched the development of a manual treadmill with a concave running surface, with a plan to have a commercially viable production model prototype ready to demonstrate at the IHRSA show in San Francisco, California, in March of 2009.24 As I understand it, a key challenge during this development effort was identifying a commercially viable method to keep the treadmill belt in contact with the concave running surface.
>
> 95. Woodway personnel, including at least Nick Oblamski, conceived of the idea of using a belt to synchronize the front and rear shafts in order to allow the treadmill belt to follow the concave running surface and shared the beginnings of this concept with Mr. Bayerlein and Mr. Vance Emons in an e-mail message on December 17, 2008,25 with a subsequent update on the concept on January 12, 2009.26 Mr. Oblamski's subsequent efforts in developing the timing belt system is captured in a number of e-mail exchanges with component suppliers and purchase orders for components during the development period including but not limited to McMaster-Carr, BRECOflex CO. LLC, and Weimer Products. A purchase order dated February 14, 2009, for the synchronizing belt and associated parts corresponds to Mr. Oblamski's e-mail discussion with Weimer Products.
>
> 96. During the development of the treadmill for the IHRSA show, Mr. Oblamski communicated with Mr. Astilean about his progress. On January 26, 2009, Mr. Oblamski sent an e-mail to Mr. Astilean with details of the treadmill design. Mr. Oblamski did not mention a synchronizing system or timing belt in the e-mail text, and these features are not present in the design files attached to the e-mail.
>
> 97. After constructing a prototype from the components procured earlier in the month, Mr. Oblamski updated Mr. Astilean on his progress in a February 25, 2009 e-mail and attached a photograph of the treadmill with a timing belt.32 In a subsequent e-mail three days later, Mr. Oblamski states that he has found a solution to keeping the belt in the desired position.
>
> 98. Having successfully reduced to practice the concept of using a timing belt to keep the treadmill belt in contact with a curved running surface, on March 17, 2009, Woodway filed its '027 Application, which disclosed the notion of incorporating a "synchronous belt" and "synchronous belt system," into a manual curved treadmill. In particular, it disclosed a timing belt, upper bearing rails, and T-slats of rubber-coated aluminum. Mr. Oblamski is named as the inventor on the Woodway '027 Application.
>
> 99. From my review of the relevant materials in this matter and my discussions with Mr. Oblamski, Woodway personnel, including at least Mr. Oblamski, conceived of and

> reduced to practice the method of using a synchronous belt and synchronous belt system, which includes a timing belt to keep the treadmill belt in contact with a concave running surface. There is no evidence of any contribution by either Mr. Astilean or Mr. Bostan in this development. In fact, Woodway personnel have noted that Mr. Astilean was not involved in the development of the timing belt system.35 Nick Oblamski of Woodway independently conceived of the idea of a synchronous belt system and other improvements to a curved manual treadmill as described in the Woodway '027 Application.

As already stated, the file material documented that Mr. Astilean and reportedly Mr. Bostan conceived the invention and created a working prototype of the leg-powered treadmill by August, 2008. The working wooden prototype was using an alternative method for keeping the lower belt portion taut and the upper belt portion concave. The file material documented that Mr. Oblamski and Mr. Astilean collaborated in building the production leg-powered treadmill. The collaboration, per the provided emails, started as early as December, 2008. The file material documented that Mr. Oblamski worked with suppliers starting around December 2008 and early 2009. The production model, Speedboard 2, utilized the synchronous belt system to keep the lower belt portion taut and the upper belt portion concave as taught to Mr .Oblamski by Mr. Astilean. **The file material does not suggest that Mr. Oblamski conceived or was developing a leg-powered treadmill with a lower belt portion taut and the upper belt portion concave prior to working with Mr.Astilean. The file material suggests that Mr. Astilean conceived of a leg-powered treadmill with a lower belt portion taut and the upper belt portion concave.**

CONCLUSIONS

Based on BFPC's investigation and analysis, the following has been determined:

1. The Astilean provisional patent application does support the subject claims in both Patents 619 and 016.

2. The Woodway provisional patent application would not anticipate the Astilean patents.

3. The IHRSA tradeshow would not anticipate the Astilean patents.

4. The sale of the Curve treadmill would not anticipate the Astilean patents.

5. The file material does not suggest that Mr. Oblamski conceived or was developing a leg-powered treadmill with a lower belt portion taut and the upper belt portion concave prior to working with Mr.Astilean.

6. The Astilean patents are not invalid under 102(f).

7. It would not be appropriate to limit the claims to the "corresponding structures" as stated by Dr.Blair. The claims should be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

8. The file material does not suggest that Mr. Oblamski conceived or was developing a leg-powered treadmill with a lower belt portion taut and the upper belt portion concave prior to working with Mr.Astilean.

9. The file material suggests that Mr. Astilean conceived of a leg-powered treadmill with a lower belt portion taut and the upper belt portion concave prior to working with Woodway or Mr. Oblamski.

SIGNATURES

This report contains opinions and conclusions that are based on the information available at this time. The conclusions are made with a reasonable degree of professional certainty and based on reliable principles in combination with my knowledge, skill, education, training and experience. Should additional information become available, the right to add to this report is reserved should it become necessary.

Beacon Forensic, P.C. appreciates this opportunity to provide consulting services in this matter. Please contact us should any questions arise concerning this report, or if we may be of further assistance.

Respectfully submitted,

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